JPRS-UMA-93-040
28 October 1993

JPRS Report

Central Eurasia

Military Affairs

Central Eurasia
Military Affairs

JPRS-UMA-93-040 28 October 1993

CONTENTS

ARMED FORCES

Interrelationship Between Army, Religious Organizations

94UM0035A Moscow ARMIYA in Russian No 11, 1993 pp 4-5

[Article by Colonel N. Kikishev, Directorate for Personnel Work, Moscow Military District, under the "Explanation Please" rubric: "The Army and Religious Organizations: What Interrelationships Exist?"]

[Text]

"Observable everywhere is a rise in religious sentiment, including among servicemen, and an increase in the number of believers. This being the case, could you furnish an explanation - at least of the major aspects - of the interrelationship existing between the Army and religious organizations, citing as a typical example a specific military district, such as the Capital Military District?"— Lieutenant P. Titov, Moscow

The above question submitted by a reader is not new to readers of the journal. Nonetheless, what follows is an explanation we requested of Colonel N. Kikishev, who is involved with this problem in the Directorate for Personnel Work, MVO [Moscow Military District].

The changes in values and ideals occurring in society and the activation of religious organizations are rendering a noticeable influence on the world outlook and behavior of the district's servicemen. The level and depth of their religious sentiment have been on the rise. This was specifically shown by a sociological survey carried out by members of our directorate. In their answer to the question of whether they believe in God, 25 percent of the respondents said "yes," they are believers; 35 percent were not sure; 30 percent were nonbelievers; and 10 percent considered themselves to be "militant" atheists.

In this regard, the following also fell out. Even of the believers, only a fifth of the servicemen profess a genuine belief in God and Church dogma, observe the rites, participate in religious activities, and attempt to win others over to the faith. The bulk of the people are not sure. Nonetheless, virtually every second serviceman is in favor of expansion of opportunities for the free practice of religious rites by all who have such a need.

The majority of those surveyed also stated that there should be a spirit of good will between the Army and the Church. An increase in religious sentiment, in their opinion, will exert a beneficial effect on servicemen's behavior and on the development of qualities such as mutual help and mercy. They feel that ignoring this kind of mood in [servicemen's] training would be a mistake.

It should not come as a surprise that many of our commanders and their deputies involved with personnel work have already introduced substantial changes into their activities, by making it possible for believers to participate in religious rites in their free time in unit and large unit deployment areas, and by inviting clergymen to hold discussions with personnel on moral and ethical topics and to participate in military rituals. A district-wide effort is underway to provide officers with reference and expository materials dealing with religion. In addition, no prohibition is placed on the wearing and keeping of religious objects on the part of personnel.

A remarkable measure illustrative of the above is a voluntary gathering of the capital garrison's servicemen organized by the Metropolitan Pitirim of Volokolamskiy and Yuryev on the occasion of the 50th anniversary of the battle for Moscow. Rallies that were held at the graves of the brotherly defenders were supplanted by religious memorial services for the fallen; military rituals, grief-expressing singing by a Church choir and by blessing of the final resting places.

In the interests of restoring the Russian Army's traditions, the voluntary gathering served to initiate closer cooperation between officers who are directly involved in the training of servicemen and priests of the Russian Orthodox Church.

Our officers were handed 300 Bibles and about 3,000 copies of the New Testament in the last few months alone. The social and state training plans now include discussions of religious topics. Working most fruitfully in this regard are the Moscow Music School, Moscow Suvorov School, and the Moscow Higher Combined-Arms Command School.

Priests are taking part in VUZ graduation of officers, send-offs of youths for military service, and in other measures related to military commissariat activities.

Thus, in November of 1992, officers of the District Directorate for Personnel Work met with Vladyka Pitirim to agree on an approach for improving the spiritual and moral education of servicemen. The present alarming situation existing in the country and the Army was pointed out. In this light, a joint search for ways to effect interaction in spiritual and moral education of service personnel, with the basis being a strong feeling of patriotism, love of and devotion to the Fatherland, the land, people, and the Fatherland's ideals and values, constitute a pressing problem for all organizations which wish to see the restoration of noble principles in the Russian Army and which are desirous of uniting their efforts in this cause.

Incidentally, the above calls for a note of caution. Some people have come up with the idea of forcing the Army, in the form of an order, to take up religious activity by introducing the military chaplain institution. In this regard, history teaches us that attempts to hold sway over the souls of people wound up as persecution and long-lasting disfavor levied at clergymen and their flocks. This was true not only in the time following October of 1917; there were many examples of that in preceding centuries as well.

As shown by the sociological survey, neither the Church nor the mass conscience of servicemen are ready for the introduction of Church structures into Army collectives. In addition, there is a real danger in opening the military environment's doors to conflicts fueled by religious differences, something which would exacerbate the already tense situation in the collectives. That is why what is needed is the tactic of "taking small steps." This kind of tactic, applied gradually, will make it possible to create conditions favorable to full-scale realization of every serviceman's constitutional right to freedom of conscience, as set down in the Temporary Interior Service Regulations of the Russian Federation Armed Forces. In the final analysis, included in respect for one's faith is respect for the individual serviceman's person.

Military Educational Reform

94UM0024B Moscow VESTNIK PROTIVOVOZDUSHNOY OBORONY in Russian No 6, 1993 pp 52-55

[Article by Candidate of Technical Sciences, Docent, Colonel Leonid Sosikov and Candidate of Technical Sciences, Lt-Col Aleksandr Pokatov, Main Directorate of Personnel Training and Placement, Russian Federation Ministry of Defense: "The New Reform Will Help the Military to Escape From the Prison of the Outlived"]

[Text] The unified officer training system broke down when the army and navy were torn apart and armed forces were established by former union republics that are now sovereign states. Forty-seven military educational institutions were left outside the Russian Federation. They include military academies and schools that trained specialists in many unique specialties.

However, the damage done to the integrity of the military educational system was basically repaired within a short time. International military cooperation in military education is being set up. It is evident that the officer training level does not fall short of any modern requirements in any way, and the idea of "fundamental dismantling" should not be entertained in the reform of our military.

This is especially important to note today, now that the reform is proceeding and the Russian Armed Forces are undergoing reductions. The training of officers capable of performing their duties in the new conditions of the country's sociopolitical development, and in Russian Armed Forces of a new countenance carrying out new missions, is one of the priority directions of military development.

The higher military school is undergoing reform as well. As we see it, there are three key problems: The organization and methods of training and upbringing, the professional level of professors and instructors, and the degree of motivation of correspondence students and cadets to master knowledge. In other words, the question as to what to teach, to whom, and how, continues to be the central one. And in it, comprehensive development of the personality is the fundamental idea. It is the fundamental principle of qualitative change in higher education.

A study of the activities of military academies and schools of the Russian Federation Ministry of Defense revealed that the training process is moving extremely slowly toward a direct orientation on the student's personality. The paradigms of traditional educational systems prevail in the VUZes. Under today's conditions they are an obstacle to training a specialist who can creatively analyze and select the methods of solving various occupational problems, can master the tools of science, is computer literate, and is capable of freely using information systems. As before, instruction in the knowledge and fundamentals of science (which in most VUZes offering a four year course for cadets has been reduced to elementary coaching with strictly dosed training material) continues to be the basis of training. In the opinion of leading pedagogical specialists, this has exhausted itself and offers little promise in the future. Teaching people to think must become the essence of training. Here, the search for the place where mandatory training in the fundamentals of science ends and creative thinking by the students about the knowledge they have received begins is more important than anywhere else. Correspondence students and cadets must be taught to think.

The ability of students to solve problems which are handed down from generation to generation in teaching circles remains the practical side of any educational discipline. These problems are often mechanically transferred from one textbook or training manual to others, and for many of them there are no longer any real analogues. The usual formalism appears to be the cause of this. Passiveness and an uncreative attitude toward the work still exist in the military. Have many military academies and schools gone over to intensive use of comprehensive qualifying assignments? The answer offers no optimism. And even so, not everything possible is being done. While the military academies have set themselves into motion and recognize the promise of this method, only a few enthusiasts are devoting any attention to it in the schools. Still, the solution of complex qualifying problems requires a diversity of knowledge and the corresponding organization of mental activity, and it gives the military specialist the professional flexibility he needs.

There will be no success in improving VUZ training unless we seek and introduce alternatives to the lecture and seminar system into the training process. One of them is to unify the training and scientific research into an integral process. Only after we develop the scientific pedagogical concepts of higher education and create effective training programs and subjects oriented on the immediate future will we be able to say that creative thinking about training disciplines prevails among cadets and correspondence students.

But unfortunately military schools, institutes, military faculties and academies have trained, and continue to

train, specialists (especially engineers) chiefly for existing (often obsolete and worn) armament systems and military equipment. The knowledge of past generations of specialists is simply being inherited by subsequent generations. The problem of determining a reasonable ratio between disciplines (subjects, topics etc.) that prepare the military specialists for today and for tomorrow must become a priority problem for VUZ science.

A complex situation has evolved in the higher military school (and in most VUZes in general, by the way) for this reason as well: The training level of the military specialist is not in keeping with the requirements of world educational standards. Moreover, the evolving market relations have made their imprint upon education as well. The practice of guaranteed placement of VUZ graduates which existed in the not-too-distant past has fallen into oblivion. Young specialists, especially those with technical qualifications, are going jobless everywhere. Taking world experience into account, a decision to introduce multilevel education in the Russian Federation was adopted. (See Decree No 13, March 1992, of the Committee for Higher Education of the Ministry of Science, Higher Education and Technology Policy). Because national diplomas are now being issued in VUZes of the Russian Ministry of Defense, the military is obligated to reconcile itself to these changes.

A three-level structure of military education has now evolved in the officer training system: Level 1—secondary military-technical education; level 2—higher military-special education; level 3—higher military education. The first level of military education is provided by military education institutions offering a three-year course of training. Their graduates are issued national diplomas of secondary technical education. The second level is reached in military academies and higher military schools (institutes) offering a four and a five-year course of education (national diplomas of higher education in the corresponding profile, qualifications and specialty). The third level of military education is received by graduates of military academies offering a three-year course, if at the moment of admission to the VUZ they have a higher education. The nature and content of the training are oriented not on deepening knowledge in a particular profile (qualification), but on acquiring special military knowledge associated with future expansion of the officer's range of activity in a new position.

Experience has shown that training materials studied in military educational institutions of the preceding level are rehashed in higher VUZes. The quality of the theoretical training of the military specialist is also decreased due to overloading of the study plan with disciplines of different kinds. And many directives and instructions regarding study programs are unjustified.

The new educational structure adopted in Russian VUZes (level 1—incomplete higher education; 2—basic higher education with the baccalaureate degree awarded; 3—training of graduate specialists with a higher education with the possibility of awarding a master's decree) will require insignificant changes in the content of the currently existing model of military education. The changes will be primarily structural (see diagram).

The first level is provided in all higher military educational institutions for specialists with a higher military-special education (with the exception of four-year schools, but these are being switched to a five-year training cycle). The table shows the amount of time budgeted to the principal general scientific disciplines in five-year higher military schools in comparison with the same kinds of VUZes under the Committee for Higher Education. As we can see from the cited quantitative characteristics, the differences are insignificant.

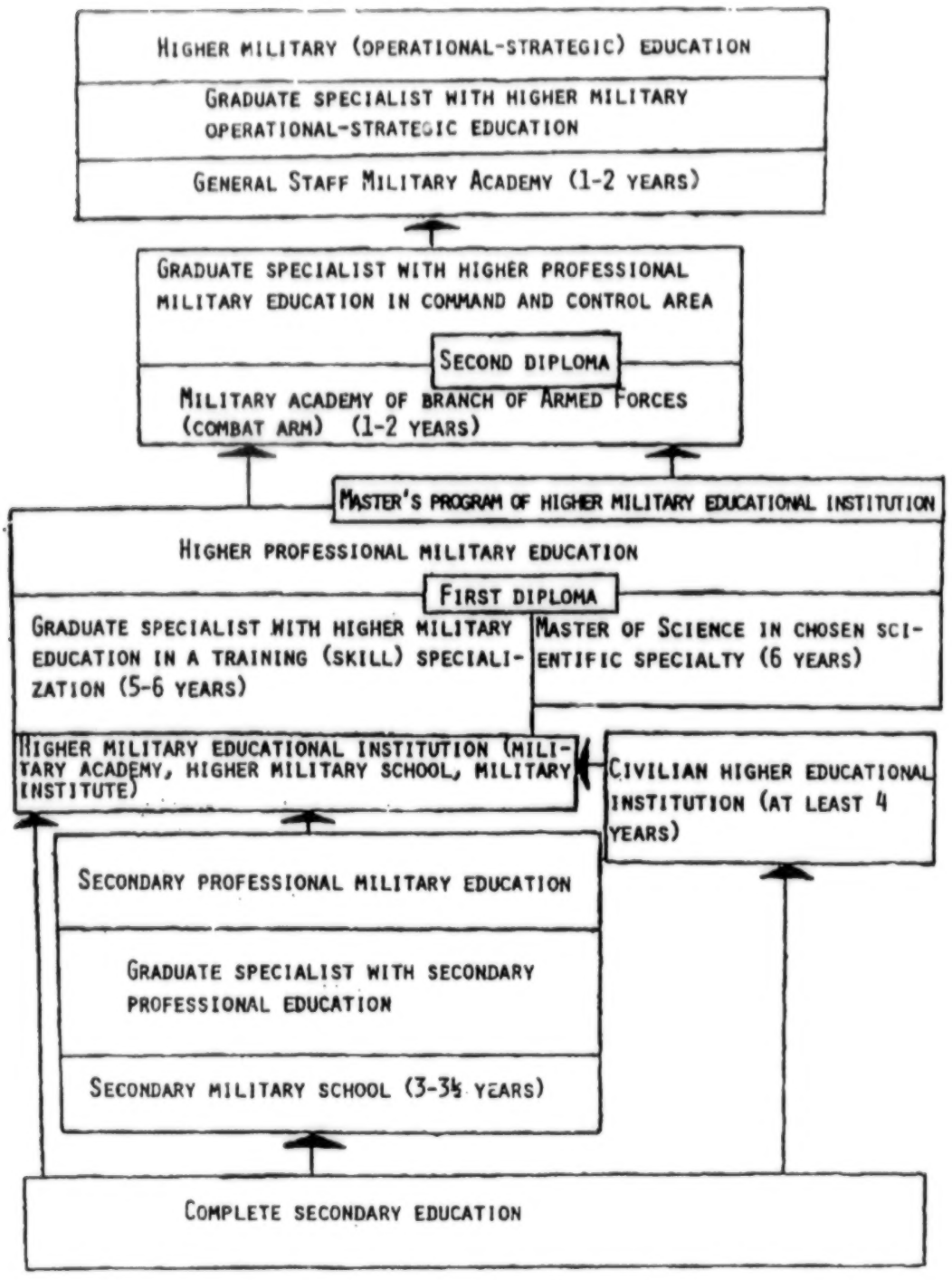
Comparative Characteristics of the Content of General Scientific Training in Institutions of Higher Education in the Russian Federation and Under the Committee for Higher Education of the Russian Federation Ministry of Science, Higher Education and Technology Policy ("Mechanical Engineer" Qualifications)

Item Number	Name of Academic Discipline	Time Budget (Hours)	
		RF Ministry of Defense (Air Force)	RF Higher Education
1.	Mathematics	430	474
2.	Physics	230	272
3.	Foreign Languages	180	216
4.	Chemistry	90	120
	Total:	930	1,192

Note: Quantitative indicators are given for the specialty "Technical Operation of Aircraft and Engines."

Presence of VUZes in the system of military education in which a number of science-intensive specialties are studied deeply (in a six-year training course) provides a possibility for their graduates to acquire the master's degree. Conversion of command schools to a five-year cadet course will ensure that level 3 higher education diplomas will be earned in accordance with the current standards and laws. Consequently the need for having a second level of education and command, command-engineer, engineer and other VUZes, except humanitarian, raises doubt. And at the third level of military education—the "military academy" level—deepening theoretical knowledge at the level of a graduate specialist does not appear suitable. The main goal of training here will be to prepare the student for his position.

Proposed System of Higher Military Education



At the same time there is an obvious need for a second education in military academies (on the condition that the former term of training is maintained). These graduates will participate in the command and control of large military collectives and complex systems of armament and military equipment, and influence social processes associated with military activity. For this, they need deeper theoretical knowledge in command and control, which is what the level 2 VUZ gives.

Analysis of the study plans and programs of five and six-year military VUZes showed that, as a rule, they correspond in content and training time budget (considering the hours of military-technical disciplines) to the plans and programs of civilian VUZes. The deviations toward the lesser side inherent to our VUZes are the result of the wide range of problems of a military theme (the military school is at the battalion level, while in a number of specialties it is up to the regiment-brigade level inclusively). If the military academies go over to training specialists on the basis of the course principle—that is, for a particular position, then obviously a significant number of the problems will be excluded from the programs. Thus, the basic training of the specialist at the baccalaureate of sciences level in, for example, command and control, will be reinforced.

These innovations create several problems, the solution of which will help to surmount the contradictions in pedagogical sciences and practice.

The first [solution] is to shape the new content of training. In recent years this problem was certainly overshadowed by new methods and forms of training. Utilizing an approach which emphasizes training in the fundamentals of science and knowledge, the higher school overburdened its students. As a result of this overload, the programs, which often lack simple logic, are undergoing continual dismantling and revisions. The conclusion begs itself: Today we need to teach the general methods of activity, and shape the capabilities of correspondence students and cadets. And if it is too early yet to talk about this approach in general scientific disciplines (mathematicians and physicists only recently began studying this problem, there are no certain results in this area in the country and abroad, and therefore it is difficult to shape the new content of the training), in the general engineering, military-technical, operational-tactical and tactical special disciplines tested resources already exist. These are: basic synopses, the grouping of materials into large blocks, emphasis on the study of theory, etc.

Another side of this problem is that of choosing the sequence of training, the logic behind the organization of training courses. What is essential here is to account for the structure and the increasing complexity of the means of activity and thinking techniques.

Scientific methodological commissions actively working under the former Main Directorate of Military Educational Institutions and the present Russian Federation Ministry of Defense Main Directorate of Personal Training and Placement established a sound theoretical foundation for introducing both new content and a sensible sequence in a given training subject. But the programs and procedures proposed by leading educators in VUZes of the Ministry of Defense are unique, they are intended to be creatively adapted to a particular military educational institution. It is only under this condition that we can count on success.

The second problem is transition from passive to active training methods which ensure the main thing: The student must learn to think independently! The merit of this is that the instructor departs from the practice of presenting material to some average student, such that the training can be individualized and adjusted. A characteristic difference can be discerned here between secondary school and VUZ training: A departure from collective instruction (including active) to dialogue, discussion, and immersion into the new realities.

These are but a few of the main problems of our military education. To the organizers of the training process, they are real. And they cannot be solved simply by directive from above: The recommendations of the main and central directorates of the Ministry of Defense are not panaceas for all woes. Only the joint efforts of all professors and instructors of VUZes will be able to make positive changes in the present character of Russian military education.

Sample Extended Service Contract

94UM0025A Moscow VOYENNYY VESTNIK in Russian No 6, Jun 1993 pp 15-16

[Attachment No 2 to Directive No DZ-31, 1993, of the Russian Federation Deputy Ministy of Defense: "Sample Form of Contract"]

[Text] MILITARY SERVICE CONTRACT

The Russian Federation Ministry of Defense in the person of (name of military unit, commander's rank, last name, first name, patronymical) and (serviceman's rank, last name, first name, patronymical) have signed this contract regarding the following:

1. Serviceman (last name, initials), who is familiar with the laws of the Russian Federation and other normative acts regulating military service, voluntarily promises:

a) To serve on the basis of a (form of contract) with a term of (term of contract) under conditions established by currently effective legislation on the procedures of military service;

b) To honorably and conscientiously fulfill official duties, the requirements of the military oath, military regulations, and orders and instructions of commanders (superiors) during the time of contract military service.

2. The commander of the (name of military unit) registers Serviceman (last name, initials) in the position of (T/O

position) with the duties, rights, privileges and advantages established for servicemen undergoing military service on the basis of a contract.

3. This contract shall become effective from the day the military unit commander signs the order entering the name of Serviceman (last name, initials) on the personnel roster of the military unit, unless foreseen otherwise by the contract.

4. The contract with Serviceman (last name, initials) may be dissolved if he is subject to early discharge from military service in accordance with Article 49 of the law "On the Military Obligation and Military Service."

5. This contract shall be drawn up in two copies, one of which shall be attached to the personal file, and the other shall be handed to the serviceman.

6. Special conditions:

7. The conditions of this contract may be amended in writing with the consent of the parties.

Serviceman (serviceman's rank, signature, last name, initials).

Commander (name of unit, military unit commander's rank, signature, last name, initials).

8. Grounds for early dissolution of the contract:

Serviceman (serviceman's rank, signature, last name, initials).

Commander (name of unit, military unit commander's rank, signature, last name, initials).

Note: 1. Signatures shall be authenticated by the military unit's official seal. 2. In the event of early discharge of the servicemen on the basis of grounds foreseen by items "c" and "d" of Part 1 and items "b"-"d" of Part 2, Article 49 of the Law, sanctions established by the Statute on Material Liability of Servicemen shall be applied to him.

GROUND TROOPS

Troop-Level Chemical Sensor Equipment

94UM0032A Moscow VOYENNYY VESTNIK in Russian No 6, Jun 93 (Signed to press 21 May 93) pp 83-85

[Article by Col. V. Kazydub, candidate of technical sciences and lecturer at the Military Academy for Chemical Protection: "New Technical Means for Troop-Level Detection"]

[Text] The complexity of recognizing the enemy's use of toxic substances, as well as destruction or an accident at chemically dangerous facilities, predetermines the presence of a complete system of technical means for chemical reconnaissance and monitoring in the troops. Structurally, the simplest devices (VPKhR, PPKhR, PGO-11, and indicator film AP-1), automatic instruments of reconnaissance vehicles (PRKhR and a family of gas warning devices), and laboratory complexes (PKhL-54M, PKhL-1, AL-4M, and AL-5) are distinguished in it.

Graduating students who take exams at our academy for the physical part of armament and means for radiological, chemical, and biological protection must demonstrate a knowledge of the purpose, basic technical specifications, principle of operation, installation, rules of operation, and place of some model or other in the mentioned system. Beginning this year, the examination papers will include analogous questions on some items of equipment recently introduced. This is what the entrants must know about them:

The **set of instruments for chemical reconnaissance KPKhR-2** is a general military means for continuous monitoring and is intended for the establishing the enemy's use of toxic substances that act to paralyze the nervous system. It comes in two versions. Special fortification and other stationary structures are equipped with modification "C", while basically chemical reconnaissance vehicles and helicopters for radiological, chemical, and biological reconnaissance are equipped with modification "B." They differ in equipment composition, power supply voltage, and weight. The design ensures its linkage with other complexes for gas analysis.

The set has two basic parts. The first of them is the **automatic gas alarm GSA-21B.** It detects vapors of soman, sarin, and VX in the air in a wide interval, including negative temperatures. The only exception is the last-named substance, for it is characterized by low volatility. The lower limit for it begins at 15 degrees Celsius.

In the gas alarm, two sensitivity modes are foreseen that make it possible to assess vapors of toxic substances at threshold and low-danger concentrations. For both modes, the high-speed response does not exceed 30 seconds. The duration of the restoration cycle depends on the concentration of the substance being analyzed and varies from 5 to 25 minutes.

The ionization method of detection is employed in the GSA-21B. Molecules of organophosphorus compounds entering the space of the ionization chamber under the influence of a constant radiation field break down into ions with different charges. Their appearance changes the magnitude of the current flowing between the electrodes. The developing electric pulse is amplified and reaches the threshold device. Here, it is compared with the assigned level and if necessary the command "dangerous" is generated for the signaling desk and to the executive mechanisms of the system for the protection of the facility.

It is not difficult to prepare the gas alarm for work. Before turning it on, it is necessary to check the reliability of the electrical connections between the units. They verify the presence of a filter band. If it is absent, a new cassette is inserted in the appropriate section. It is sufficient for 60 hours of continuous work.

By turning the switch for the selection of the sensivity mode to the position "Threshold-2," they turn on the "Network" and allow the instrument to warm up until the "Analysis" lamp lights up. This requires 20 minutes. It is then recommended that the electrical circuits be tested by pressing the "Control" button. If everything works well, then within 10 seconds the "Danger" lamp lights up and goes out within a minute. There is a built-in control device that automatically tracks the functioning of the gas alarm. The "Defective" lamp signals the failure of the thermostatic control system, an open cover of the filter compartment, or the breaking (end) of the band in it.

It is planned to check the warning effect periodically with the help of a special formula. The contents of the ampoule with which the dosing apparatus is equipped are sufficient for 6 months. Each time they introduce from 3 to 10 doses of the simulator into the ionization chamber through the intake connection. If the gas alarm is properly adjusted, the "Danger" lamp lights up and goes out 25 minutes after complete purification of the air tract.

The **automatic aerosol warning device SA-11B** registers VX aerosols in the air that correspond to contamination densities of up to 10 mg per square meter. The working cycle is a little more than 2 minutes with a high-speed response of 15 seconds. The operating principle of the warning device is also based on the change of electric parameters. When aerosol particles of an organophosphorus toxic substance land on the solid-state indicator element (TIE), its resistance is reduced. Accordingly, there is an increase in the measured current. This pulse is amplified and is tranformed into the "Danger" signal. The previous state of the TIE is restored through evaporation of the toxic substance, for its surface is always heated to 150 degrees Celsius. The TIE is changed every three days, and during combat operations, every 24 hours.

The detection unit is set up outside the facility. And, without going out into the atmosphere being analyzed, it is remotely turned around its own axis with the help of a lever on the forward panel of the control and signaling desk so that the TIE is given maximum ventilation by the air flow. Colored lamps on it depict information on the state of the unit: Turned on, ready for work, detection of aerosols, etc.

The working capacity of the warning device is monitored by applying a simulation formula to the TIE.

The **indicator tube IT-51** (marking—a ring and two red points) is intended to analyze vapors of certain organophosphorus toxic substances. To be more precise, tasks in chemical reconnaissance and chemical control are resolved with its help.

The IT-51 is distinguished from the IT-44, which it replaces, by a three-layer filler. This changes the methodology of air analysis somewhat, which is now done using only one indicator tube. Instead of a control indicator tube, a layer of sorbent remote from the marked end is "working." Vapors of toxic substances are absorbed on the near end. And the middle serves as a kind of barrier between the "clean" and "dirty" halves.

First of all, one must remember that tubes without cracks and shearing and with intact ampoules are considered suitable for use. Their contents are transparent. The color of the filler is white with no colored impurities.

When the indicator tube is opened, they insert its unmarked end into the collector of the pump VPKhR (PPKhR, PGO-11) and pump through the previous volume of air. With an ampoule opener, they break the lower, and 2-3 minutes later, the upper ampoule. After shaking vigorously, they moisten the sorbent. Then, after the same interval of time, they observe the change in its color, paying no attention to the middle layer, and draw conclusions about the degree of contamination of the air with toxic substances:

Color of Filler Layer		Concentration of Toxic Substance
Upper	Control	
Crimson	Crimson	Very dangerous
Crimson	Violet (blue)	Dangerous (low danger)
Change from crimson to violet		Not dangerous

One can accelerate the confirmation of the presence of organophosphorus toxic substances in dangerous and very dangerous concenrations by reducing both the volume of air absorbed through the indicator tube (20-30 pumpings) and the interval between the opening of the ampoules (to 30 seconds). A complete investigation for the purpose of establishing the possibility of removing gas masks takes an average of 7 minutes. It is indispensable to warm up the indicator tubes if the ambient temperature is below 10 degrees Celsius.

AIR, AIR DEFENSE FORCES

Reform of Air Defense Training Examined

94UM0011A Moscow VESTNIK PROTIVOVOZDUSHNOY OBORONY in Russian No 4-5, 1993 pp 25-26

[Article by Col Vladimir Barvinenko: "Is Rehearsal Before an Operation Necessary?"]

[Text] At present our former allies and adversaries in the Second World War continue to pay great attention to practical rehearsal of offensive and defense air operations by air-assault forces and air defense troops. Here the main feature of such rehearsal is the fact that execution of each mission planned for a future war is

played out completely, under conditions which maximally approximate combat. All personnel are called on to perform these tasks with some regularity.

This is confirmed by the actions of the offensive air forces and the air defense troops of the U.S. and NATO in exercises and in local wars.

The need for practical training of troops and forces for the conduct of operations was demonstrated with particular vividness by the multinational forces (MNS) in the war in the Persian Gulf. In the preparatory stage for this war, in the period from August 2, 1990 to January 15, 1991, more than 200 exercises were conducted, at which they rehearsed the joint actions of the Multinational Forces for the sake of accomplishment of unified combat missions in the air, on the ground and at sea, and also actions of individual formations of various levels. The training of the flight personnel began back on the continent at an air base whose terrain and climatic conditions largely matched those of the zone of the upcoming combat actions. At these exercises, crews of F-117A, F-15, F-16, and F-111 aircraft practiced night strikes. After they had flown to their new base, practical training to accomplish the combat missions continued, now with a full complement of carrier and tactical aviation of the Multinational Forces before the start of the war.

The able and coordinated actions of offensive air forces must be opposed by no less able and coordinated actions of the troops and forces of air defense of all branches of service. Troops and forces of air defense belonging to different formations will together have to perform the following very complex operational missions in their operations and combat actions: —repel massed strikes of offensive air forces of the adversary through joint efforts in their common areas of responsibility; —destroy enemy aircraft in the forward air echelon at the far approaches, before their cruise-missile (KR) launch points; —search for and destroy cruise missiles over quite wide areas of their probable flight paths; —destroy special aircraft (reconnaissance and command and control systems) of the adversary and their covering forces; —concentrate the efforts of aviation in narrow sectors of the front to prevent a breakthrough the air defense system by the offensive air forces of the adversary; —concentrate efforts on covering groupings of naval forces performing the missions of naval operations.

Do our air defense troops and forces know how to accomplish these tasks effectively? Analysis of exercises shows that this question is very hard to answer, since in most of these exercises, practical rehearsal of operational missions was not completely carried out. As proof of this I will cite the following facts and examples.

First of all, it is a secret to no one that at almost every exercise the command and the staffs of air defense formations pay primary attention to the planning of operations (combat actions). In the plans, the troops and forces of the air defense formations and fleets really "trounce" the air adversary at the far approaches, in heavy jamming, while concentrating their efforts in narrow sectors of the front, etc. That is, they accomplish all operational missions. However, in practice, the documents are put away in the safes, and the repulse of strikes by aircraft simulating the enemy offensive air forces is carried out on the principle of when there is a target, scramble a pair of aircraft; when there is another target, scramble another pair.

This situation occurs because, as a rule, the flight paths of the attacking aviation are drawn up so that the combat crews of the air defense weapons and the fighter aviation crews will get as much work as possible. Here, the flights of the performance-grading intercept targets are in dispersed battle formations of low density, coming from different axes, with a simplified jamming situation, or even without one. Thus, in the basic part of the exercises, in operations against real aviation, the formations in fact practice not operational but tactical missions.

Second, as a rule, the exercises hardly ever completely rehearse the first of the mentioned operational missions: Repulse of the enemy air strike by aircraft and air defense weapons under conditions of complete or partial suppression of the air defense command and control system. In his operations, the adversary sets himself the primary goal of disorganizing the command and control of air defense troops and forces. So, it will be possible to successfully resist the adversary only if actions are rehearsed ahead of time, in accordance with previously developed scenarios.

In addition, the increased combat capabilities of fighter aviation, the Antiaircraft Missile Troops of the PVO, and SAM assets of the other branches of service intensify the mutual influence of their actions, so that without preliminary rehearsal of methods of coordination when there is disruption of command and control of AD forces, there will be heavy aircraft losses to the fire of friendly weapons.

Third, within the framework of operational training, out of safety concerns the line units systematically fail to rehearse the second of the mentioned operational missions, that of destroying aircraft with the forward air echelon. At exercises the fighters are either not sent out to their full radius of action, or only a few operate there.

Fourth, theoretical studies of questions concerning accomplishment of the fourth of the above operational missions, the mission of combating tactical special aircraft such as the E-3 of the AWACS system, show that this must be accomplished through the joint efforts of specially trained antiaircraft missile troops, aviation, and supporting assets. However, the exercise practice has often proven to diverge greatly from the theory.

The rehearsal of other operational missions of air defense has also been carried out with great restrictions and simplifications. This occured not just now, but even when each of the branches of service was not experiencing shortages of material resources for combat and

operational training. How then can we accomplish this task when there is a sharp restriction of assets allocated to defense at present?

Research shows that several solutions are possible here, of which the following are the most realistic.

The first solution lies in the simple "survival" of the air defense troops and forces until better days. Here, efforts would be concentrated on maintaining the combat proficiency of the crews and subunits at the tactical level. Measures of operational training would be conducted basically by the method of staff exercises and games, and their rehearsal would be put off until there was a change in economic conditions.

An alternative solution would be a sharp reduction in the number of air defense troops and forces to a level at which the allotted resources would make it possible to conduct combat and operational training at the minimal necessary level.

Obviously both of these extreme solutions are unacceptable because they fail to fulfill the basic principles of reform of the Armed Forces. The first of them [violates] the principle of guaranteed provision of defense on the basis of primarily qualitative parameters in development of the Armed Forces. We would not be ready to accomplish air defense missions in more or less major military conflicts; and in general, we might lose the operational art of the Troops of Air Defense. In the second case, the principle of defensive sufficiency would not be fulfilled. At present, given the economic crisis, the allocated assets are clearly insufficient. The situation is exacerbated in that economists predict that Russia and the other states of the Commonwealth will take a long time to emerge from the economic crisis.

Apparently, an optimal solution must be sought between these two extreme paths. Here, the minimization of general expenditures for operational training, with resolution of the problem of practical readiness of the troops to perform not only combat but also operational missions, must occur through consistent concentration of a specific percentage of resources in each joint exercise of formations of different branches of service.

It must be noted that in addition to the other causes of the failure of the line units to rehearse operational missions, there is their insufficient theoretical development, the failure to resolve the legal relations between the formations of the branches of service, and the low level of logistical support.

The planning of measures of operational training in formations conducting their operations and combat actions in common regions, by the General Staff and the main commands of all branches of service will lead to an excessive number of such measures. This is so burdensome for the command and staff that there is practically no time to think about how best to accomplish the combat missions. In order to have time to do everything, the documents must simply be hurriedly copied, with some adjustment based on the specific features of the situation created in the next measure.

To change the working conditions of the staffs, it is advisable to reduce the total number of operational training measures by combining them for formations performing combat missions in common regions. This will make it possible to prepare them more thouroughly, and to work out all the questions of operational use of troops and forces.

Practical rehearsal of operational missions demands the involvement of a large number of personnel and high expenditures of material resources. The "departmental" affiliation of the formations has led to a situation in which none of the branches of service assumes payment of these expenditures when there is joint mission rehearsal.

The combining of operational training measures of formations of different branches of service and the creation of material conditions for their joint operational training demand the establishment of clear-cut legal relations between them on these matters. What is more, experience has shown that the complexity of theoretically resolving questions regarding accomplishment of operational missions and performance of the necessary organizational and technical measures, as well as logistical support, does not allow them to be fully resolved by the manpower of formation staffs. To achieve maximal effectiveness of operational preparation given the allocated minimal resources, it would be advisable to involve scientific institutions in this work. They already have that kind of experience.

Advantage of Airborne CP for Air Defense

94UM0024A Moscow VESTNIK PROTIVOVOZDUSHNOY OBORONY in Russian No 6, 1993 pp 48-49

[Article by Col Nikolay Poroskov: "'Shmel' Sees All"]

[Text] The main problem for air defense is detecting small low-flying targets. Traditional radar—ground radar stations—is sometimes found to be ineffective if the target utilizes terrain features on its route. For example, it may travel through a mountain ravine. In this case the station's radar shadow prevents it from seeing the target.

The idea of raising the radar to an altitude of several kilometers, and thus incomparably broadening its possibilities, was born back in the mid-1950s. As a result, the Americans now have several modifications of the E-3 AWACS, an early warning and guidance airplane.

In 1961 our air defense forces received the Tu-126 airborne radar patrol and guidance system [AK RLDN] (based on the Tu-95 strategic bomber) carrying the Liana radar system [RTK] capable of detecting airborne targets beginning with moderate altitudes. Soon after, however, attack aviation acquired the tactics of surmounting air

defense systems at low and minimum altitudes, which practically reduced the possibilities of the systems to naught

Beginning in 1965, Moscow's Scientific Research Institute of Instrument Making conducted research aimed at designing a system capable of detecting targets on the background of the underlying surface (steppes, forest, mountains, water). The Shmel RTK was created under the guidance of chief designer Vladimir Ivanov at the Vega-M Scientific-Production Association. It was subsequently installed in the Il-76 MD airplane. The work was done at the Taganrog Aviation Scientific-Technical Complex imeni G. M. Bershev (chief designer, Aleksey Konstantinov). The new item was named the A-50, and in 1984 it was adopted by the air defense forces.

The following are the RTK's specifications and performance characteristics:

- Patrolling time in the air without refueling to a distance of 1,000 km from the take-off airfield—4 hours.
- Range of data transmission to the command posts of armed service automated control systems by radio meter and decimeter bands—to 350 km, shortwave band—to 2,000 km, satellite communication—over 2,000 km.
- Crew: flight—five, tactical—10. Maximum airplane take-off weight—190,000 kg.

The Shmel RTK has an onboard three-coordinate radar station, apparatus for determining country of ownership, a system processing the data and displaying it at the work stations of the tactical crew, and a system for digital communication with ground and shipborne posts interacting with the airplanes. It also carries data documenting equipment.

Information on targets obtained by the A-50 is used by the tactical crew (combat control officers) to guide fighter-interceptors and attack aviation, and it is transferred via digital communication lines to special transceiving centers at the command posts of armed service automated control systems. When working great distances from command posts, relay satellites are used for data transmission.

The A-50 can serve as a flying guidance post, a radar post, and even a command post if people with the corresponding authority are aboard; and, it has the possibility for transmitting information to submarines surfacing at an indicated time. The onboard computer displays data on the screen in color in alphanumerical and panoramic form. Guidance is accomplished both by automated channels and by voice—that is, by transmitting commands over the airwaves.

During the events in the Persian Gulf, two A-50s patrolled over the Black Sea, watching the airspace by our borders. The Shmel did not do badly during exercise Oborona-92 [Defense-92].

The USA devotes a great deal of attention to developing AWACS airplanes. In the estimation of Western specialists this system's introduction is equivalent to doubling the number of air defense fighters. There is a program for modernizing the E-3 by 2010, and enormous resources are being invested. Work is also going on in our country—with regard for the fact that the A-50 has a dual purpose. It may be used (besides for military missions) to fight smugglers in light airplanes, to protect fishing zones, and to escort international runs over Siberia, especially in areas unreachable by ground radar. The significance of the A-50 also rests today with the fact that the old air borders have been scrapped, and the new ones are only just forming.

REAR SERVICES, SUPPORT ISSUES

PVO Deputy CINC Chubenko On Support Issues

94UM0178B Moscow VESTNIK PROTIVOVOZDUSHNOY OBORONY in Russian No 4-5, 1993 pp 61-64

[Article by Deputy Commander-in-Chief of the PVO Maj-Gen Yu. Chubenko: "Toward Businesslike and Honest Cooperation"]

[Text] Without changing our attitude toward the Rear Services and their structure, it is hard to expect very rapid improvement in the work of the military economic mechanism. The Deputy Commander-in-Chief of the Air Defense Troops, Maj-Gen Yuriy Chubenko, gives his thoughts on this subject.

Our reference: Yuriy Timofeyevich Chubenko was born on April 22, 1948. He is a graduate of the Academy of Rear Services and Transport and the Academy of the General Staff. In September 1992 he was appointed to the post of Deputy CINC of PVO [Air Defense] Troops. He is responsible for rear services support, construction and billeting of troops. He has served in Central Asia, the Urals, and in central oblasts of Russia. He is married and has two daughters.

The processes occurring in the country naturally are also reflected in the military organization. They have not bypassed the rear services of the PVO Troops in the broad sense, as the material basis of daily activity and comprehensive support in the conduct of combat actions. Every day we encounter any number of problems and difficulties which have been engendered primarily by the profound economic decline in the country: the crisis in the financial system, the drop in production, and other painful manifestations associated with the transition from a planned-distribution system to a market economic system.

There is no denying that the Armed Forces are basically a budgetary organization. They have found themselves in a

critical situation from the standpoint of their protection, in terms of safeguarding and maintaining their combat might, the social welfare of the service members, and ultimately the prestige and importance of the Armed Forces as an instrument of protection and defense of the state.

Given the limited appropriations, the continuous catastrophic growth of prices for all types of military goods makes the accomplishment of the tasks of rear service support difficult and sometimes problematic.

Successful accomplishment of missions by the Armed Forces of Russia both in peacetime and in war will depend to a significant extent on the condition and effective functioning of the system of rear service support, and its capacity to accomplish its assigned missions under diverse conditions.

Today the Rear Services of the Armed Forces of the Russian Federation are not meeting the imposed requirements, and even before did not meet them fully. Basically it was involved in general logistical and medical support, and in technical support by rear services. But in other types of rear support, it performed only a monitoring and inspecting function. Essentially, under the conditions of a planned state economy, it was a declarative-supply organ, a distributor of assets and limits. The economic situation has changed. The need has arisen to revise the meaning and purpose of the Rear Services of the RF Armed Forces as such; to give it the additional functions of organizer of comprehensive rear support in the interests of all branches of service, while transferring some authority for resolving questions of troop supply to the regions. I have in mind the creation of a territorial system of rear support by combining warehouse, communications, airfield, transport and other networks and bases into a unified extradepartmental system of rear support.

Today, under the conditions of the still unruly and unrestrained market, when the collapsed or pulled-down funded economic ties have begun to slip, when there is no hope of a return to former conditions of supply, we must move quickly and without hesitation to direct contractual contacts and ties; especially since market relations have been strengthened in the Law of the Russian Federation "On Deliveries of Products and Goods for State Needs."

Of course, the policy of commercialization of the Armed Forces has proven ruinous. One must learn to trade, but selling so as not to cheat oneself, that no one has to learn.

Many of our military businessmen have rushed down the second path, simultaneously confusing their budgetary and personal purses. They have begun to do everything in hopes of assuring themselves a carefree future during the brief period of confusion. There are many examples of this. These include the "Archangel affair" and the creation of a whole group of commercial structures by the former chief of the Rear Services of the Moscow PVO District.

At the same time, civilized market relations do not at all rule out the establishment of businesslike, mutually advantageous relations of benefit to our work. Such relations of mutual assistance had developed even earlier, but there was no mass theft or narrow-mindedness. Then the absolute majority of rear-service personnel were concerned about their work. It was a rare exception when lackadaisical administrators abused their service position. But today, or more precisely in the recent past, a significant majority, including officers, rushed to "buy and sell." It is remarkable that in this business commanding officers of various positions and ranks predominated, along with former political officers, those who until recently had maintained or were called on to maintain ideological and moral purity of the party ranks. Evidently they were convinced that the commercial ferment had to be successfully utilized on any front, including the economic one. For such, self-seeking became the motto of the day.

To be fair, one must put a large part of the blame on those officials of the Armed Forces who thoughtlessly opened the sluice-gates of "commercialization" in order to muddy the waters. They did irreparable harm to the entire troop organism.

But even before, contract relations had been built up and successfully resolved everywhere. For example, take the potato and vegetable growing season. Were these not leasing relations, in which the potatoes were planted and the corn sowed on the kolkhoz ground on a contract basis, and payments were made with the harvest, gathered by their joint efforts. In a number of cases, the mutual storage of one-another's products made it easier. Only then no one counted the debts. They knew that the army was the people's: It was given things gratis, and did not take anything for its services.

But now the situation has changed: Everyone has begun to count. And the army has become a "parasite." Well fine, now it is time for us to present a bill too. Up to a point, we can ruin vehicles and burn up gasoline. Impoverishing ourselves, we can give our last and our best to the virgin-land battalions, or work for our commander's gratitude at enterprises and in the *kolkhoz* fields.

Today we are ready to provide all possible (only for the military) assistance and services to all who need them, but on one condition—for pay. And already dozens of virgin-land battalions and companies have become unnecessary. But the market is the market. Here all buyers are equal, the military too, so the chief criterion becomes the availability of finances. If there is money, it is possible to resolve any questions on the spot—by establishing market relations, specific and mutually advantageous for the given region or territory. And they do not have to be run from Moscow.

It is not necessary to distribute funds for fish in Moscow, if the fish are to be found in the Far East. It is not necessary to allocate cement for Novorossiysk, if it is produced there. It is only necessary to allocate money, and to give the opportunity to dispose of it economically on the spot. Gosplan has passed away. And the central distribution structures will die away over time.

Beginning today, we must gradually switch over to a principle of territoriality, and abandon departmentality. This is not an idle question. However "conscientious" and "orderly" the military districts might be, they remain the property of the Ground Forces, with concentration of power in the hands of their Commanders-in-Chiefs. They could not be understood in any other way.

But the times and the situation dictate new demands. The mobility of the troops, the limited appropriations, and the reduction in the administrative apparatus presuppose the creation of a new system of rear service support of the troops. As I see it, this might be a territorial system of rear support (TS TO), which when divided into several territorial zones (TZ TO) (I see 5 or 6), would fit in the regional fuel-energy, labor, and economic formations.

At the same time, this allows for the most important (basic) communication, transport, water, and air (airfield) entities and other structural formations within the limits of the given region. For example, the rear organs in the Urals (bases, warehouses, airfields, roads, etc.) are combined into *rayon* (regional) centers making up the Ural Zone of Rear Support. It is headed by the commander of this zone. He organizes and supports all troops regardless of their branch (arm) affiliation, both those garrisoned within the borders of the TZ TO and those arriving (sent in) to perform missions that might arise.

At the same time, the commanders of districts (armies), and commanders of different levels concentrate their efforts on the organization of combat training and activity of the troops. Simultaneously, they resolve questions of coordination with the command of the TZ TO through their sharply cut rear services apparatus. This will significantly reduce the cumbersomeness of the entire district (front, army) organism, raise the mobility and autonomy of the troops, reduce expenditures for transport of materiel, and preclude any attempt at a departmental solution of the question.

This will be in keeping with the purpose of the Rear Services of the Armed Forces to support all branches of the Armed Forces equally, since the commanders of the TZ TOs will have to be subordinate only to the chief of the Rear Services of the RF Armed Forces. And the rear service headquarters of the branches of the Armed Forces will retain the functions of coordination, supervision, coordination, etc.

This is axiomatic, and those who do not agree are primarily interested in having priority in rear affairs.

Today such thinking is outmoded.

The next step would be transition to logistical, medical, and social/consumer support of the Armed Forces by domestic economic structures (state, commercial, and other production organisms). Gradually the Armed Forces would be relieved of the functions which are not inherent to it: Construction with unit resources, service and maintenance of the municipal housing fund, raising cattle, etc. There are different paths: Both by arranging orders for delivery of wares for troop needs on a competitive basis, and by contracting out Armed Forces services.

As I see it, the reduction of the structures of technical support into a unified (common) system of support of combat and daily activity of the troops under a single headquarters equally with rear support would be another direction of reform of the Armed Forces.

Today as never before, these two most important types of support interact with and supplement one another. In performing the tasks of comprehensive support of troops under market conditions, when relations between services and enterprises will be structured on direct contractual ties, it becomes an objective necessity that we concentrate financial and material resources in the same hands and allow maneuver with these resources in the interest of priority tasks.

The combination of functions of rear and technical support, and subsequently the distribution of all types of resources under the single denominator of support of combat activity of the army will become increasingly tangible in the transitional period of development of the Armed Forces on contract and professional principles.

In order that our units successfully work at combat training, their rear structures must resolve the tasks of comprehensive and complete support, the essence of which, based on the above, will be marked by a different content.

The Rear Services of the PVO Troops even now to some degree correspond to the coming integration of support structures. We have the concept of aviation rear services, which include air weapons supply (ASP) and technical support (engineer-airfield, automotive, electric and gas, and air-technical services).

As we see it, the Rear Services of the PVO Troops to one degree or another are already an all-arms entity. This is especially characteristic of the rear services of the Moscow PVO District. All the supply structures corresponding to the proposed organizational changes exist precisely in this formation.

Today the Rear Services of the PVO Troops is living the same life as the entire army, resolving complex problems and difficulties imposed by the transitional period. It is hard in the country, no easier in the army. But to the honor of the absolute majority of our rear personnel, the most difficult period of reform is ending without particular shocks. And life is imposing many tasks, each of them building up the preceding. In preceding articles, officials of the headquarters of the PVO Rear Services earlier expressed our desire to accomplish them.

Difficulties have been intensified by the very severe shortage of fuel resources and the need to withdraw the

troops from the Baltic, Transcaucasus, and now Tajikistan. But you know, just withdrawing the troops is only the tip of the iceberg. Under conditions of strict customs scrutiny, we must transport hundreds of thousands of tonnes of materiel and the families of refugees and service members with their accumulated property, and provide them with everything necessary, even if in minimal quantities.

There remains the problem of rear support of the troops who, for a number of political reasons, are still performing combat missions on the territory of neighboring countries.

These tasks are being resolved at great effort, but more or less successfully. The labor has been invested by hundreds of people, commanders, pilots, and of course rear service specialists who work every day so that people will be clothed and fed, and live in warm surroundings. The stage of reform of the PVO Troops and their rear services is gaining strength and scope. Its final goal is creation of highly effective structures capable of accomplishing the tasks of protecting our motherland, Russia.

UKRAINE

Skypalskyy Views Security Issues

944K0015A Kiev LITERATURNA UKRAYINA in Ukrainian No 38, 23 Sep 93 p 1

[Interview with Major General Oleksandr Skypalskyy, head of the Union of Officers of Ukraine by Anna Lazareva, correspondent of UNIAN; place and date not given: "Are the Russian Security Services Making the Ukrainian President a Subject of Provocation?"]

[Text] Rumors of this sort of plan have been worrying the Ukrainian citizenry since the return of Leonid Kravchuk from Massandra. Not only the head of the National "Rukh" of Ukraine, Vyacheslav Chornovil, but also the presidential press service, have found it necessary to speak on the theme of the betrayal of national interests. The conversation of the correspondent of UNIAN with the head of the Union of Officers of Ukraine, Major General Oleksandr Skypalskyy, also began with this "hot" topic.

[Skypalskyy] I do not know for sure that Leonid Kravchuk, whom I respect personally (I am not afraid to say this), is target number one for the pro-imperial forces. They are interested in pushing Kravchuk out of political life, as a moderate and flexible person, who stands in the way of the return of Ukraine to the bosom of the empire. It is not possible to manage in this without the participation of the structures which were formed in the system of the former KGB of the USSR. Kravchuk has truly done all that he could when he postponed the resolution of the oil problem for a month. But look, who actually is putting pressure on him? The national-patriotic forces—those on whom Leonid Makarovych, as an advocate of the idea of a sovereign Ukraine, has to rely. The chauvinists are lurking and waiting to remove their opponent by the hands of his supporters.

[Lazareva] But how is it possible to reconcile a certain sovereignty and the signing of the "Agreement on the new economic commonwealth (union)", in which it is foreseen that customs, financial, foreign, and military policy will be brought into agreement?

[Skypalskyy] To my mind, the return of Ukraine to the empire is a theoretically possible, but in practice a tragic outcome for the situation. I am certain that Ukraine in such a case would go the way of Yugoslavia and the Transcaucasus, since there are forces in the republic which will defend its independence by all available means. To my mind, they have the moral right to defend the fatherland.

[Lazareva] At this point, the logical question about the Ukrainian National Self-Defense Force arises. What is your position on this unregistered organization?

[Skypalskyy] It is a good thing that you asked. In fact, I know the Ukrainian National Self-Defense Force fairly well from my former work—in military counterintelligence of the Ukrainian Security Service—and I also know that certain representatives of state structures and of government departments and even of the services are preparing an accusation that the Ministry of Defense, the social-psychological service, and even I, personally, stand behind the fighters. This does not correspond to reality. Although I see among them lads, in an absolute majority patriots for Ukraine, who will defend her interests in all ways, I do not share their methods; I do not condone actions which harm the political image of the state.

[Lazareva] Why, in your mind, are the leaders of this organization studying in depth the work of the western security services?

[Skypalskyy] If in fact this is the case, then it is fair enough; and if every Ukrainian understood well the problems of the activity of the security services, the state would only become stronger.

[Lazareva] How did the case of one charge against you officially end—on the sale of military secrets of Ukraine to the Americans? According to the rules of the law, if the information of Marchenko and Charodeyev does not correspond to reality—and this is apparent from the fact that you are working in this office—then a criminal case of slander should be initiated against them...

[Skypalskyy] It is possible, but I decided to proceed a little differently. The accusation was fabricated, not by deputies and not even by newspaper people, but by a few adventurers from the military intelligence service with General Fedyayev in charge. This is not the position of the entire Ukrainian Security Service. In this context, I also regard the newspaper, KIYEVSKIYE VEDOMOSTI, and even those tendentious deputies as victims of disinformation. For a general of the Ukrainian army to take a victim to court would be pointless.

[Lazareva] Then another question on the contacts of Ukrainian soldiers with western ones: the Minister of Foreign Affairs of Ukraine, Anatoliy Zlenko, is spending this week in France and Belgium. The leadership of NATO is among his important conversation partners. But at home, voices state much more loudly that this is utopian—to expect that NATO will be interested in mutual cooperation with Ukraine...

[Skypalskyy] Those who have declared that there is no prospect of possible cooperation of Ukraine and NATO are, at least, insincere. Ukraine is now putting the brakes on economic reforms, and the lack of funds and the desire of high officials in the Cabinet of Ministers to develop the national Armed Forces, will make our path to European military alliances a longer one than for the countries of Eastern Europe. But Ukraine has no less potential possibility than, let us say, Poland. In fact, during his tour of Poland, the Czech Republic, and Slovakia, the Russian president indicated that he is not frightened of Poland's entry into NATO. The sooner that

Russian politicians realize that good relations with Ukraine means a strengthening of their borders, the better.

[Lazareva] Now I want to ask you about your position on such a contradictory term, as "transparent borders..."

[Skypalskyy] The transparent nature of borders does not mean the lack of control. Ordinary, one should not copy the model of the former USSR, where the fences had three to five layers of barbed wire. But the principle of transparent borders is only the permission to cross borders without special visas, using national documents. I am sure that borders have to be controlled strictly. Then we will not find such unpleasant situations, as when the prime minister does not have a clear answer to a question by parliament on export and import.

[Lazareva] As far as I understand, you are not delighted with the plan of renewed integration with the countries of the former Union?

[Skypalskyy] It is possible to be integrated when state structures are fully formed, when there is something to integrate. The proposal of the Belarusian and Russian governments can be accepted only if the principle of the territorial integrity of the states is clearly maintained.

[Lazareva] In this context, is it possible to lease Sevastopol's infrastructure, while the decision of the Russian parliament "On the state of the city of Sevastopol" exists? But it is possible "to loan only that which you possess"?

[Skypalskyy] As a lawyer, I share this position on the question. Because if the base is transferred to the use of the Supreme Soviet of Russia, without repudiation of this decision, de iure this will mean that Sevastopol is transferred as Russia's permanent possession. This would be a sensitive point for Ukraine not only because it would lose a part of its territory, but it would also create a precedent for the division of territories and the violation of the Helsinki accords.

[Lazareva] From your point of view, is there a prospect for a project to create a Baltic-Black Sea union?

[Skypalskyy] Undoubtedly. Along with us, countries with significantly less potential possibility are developing. But the Baltic States are gaining ground, since radical reforms are being carried out. Poland also has left the Russian Empire, and Finland has not perished... The creation of such an alliance as a Baltic-Black Sea union would restrain certain imperial structures, which grow more insolent with every day. No one in the world gives up a restraining factor, without creating at the same time aggressive structures.

[Lazareva] And neutral status, against which quite a few political forces of the state are now speaking out? Does it not harm the establishment of advantageous international contacts, which would guarantee for Ukraine the same nuclear security?

[Skypalskyy] Without doubt, neutral status influences military policy. As far as truly pacifistic factors are concerns, it is a very good thing if the state is not aggressive. But the political realities show that absolute neutrality is both impossible and economically unnecessary. It would be advantageous for Ukraine to develop the closest relations with those countries that defend our path to independence. In a bloc with military allies or without them, the state must do everything possible so that its armed forces will be capable of defending its territorial integrity. Thus, the policy of neutrality is fine as a strategic, but not as a tactical goal.

[Lazareva] And the last question: what is the present situation of the military attaches of Ukraine? Who actually in the government is blocking the issue of their financing?

[Skypalskyy] As the chief of administration of the Ministry of Defense, it is very annoying to me that representatives of our government (not all, ordinarily, take part in this), for half a year have been unable to allot a miserly portion of funds for the support of military attaches abroad. There is nothing like this in any other country! Japan, Switzerland, the states of Europe each have three or four military representatives in Ukraine, who are establishing relations on the diplomatic level with the Ministry of Defense of Ukraine. Ukraine has only two attaches: in the USA and in Russia. Minister of Foreign Affairs Zlenko has allotted pennies for the maintenance of the attaches, and the Cabinet of Ministers has abandoned the poor little thing. This could all be settled in two days.

[Lazareva] And who exactly?

[Skypalskyy] I would not want to return to the atmosphere of 1937, when everything was judged as sabotage. As a professional man, I understand that it is possible to take the path of accusations. But I am trying to do something else: to shame our government officials, through the means of mass communications, and to show how low their professional level is in the process of creation of the state. And whether this is done knowingly or unknowingly is a matter for the conscience of these people.

CAUCASIAN STATES

Threats To Russian Personnel, Weapons In Transcaucasus Commonplace

93UM0036A Moscow ARMIYA in Russian No 11, 1993 pp 10-12

[Colonel of Justice Viktor Kruk interviewed by Major Aleksandr Krokhmalyuk: "Alarm: Caucasus Fault Line"]

[Text] **A Russian officer was killed... A group of militants carried out an armed attack on a Russian military unit depot... A Russian Armed Forces column carrying humanitarian cargo to Abkhazia was shelled...**

It seems that reports of this type are becoming commonplace. Radio and television announcers deliver them matter-of-factly, as if they were giving the weather forecast. Meanwhile, the situation of the Russian forces in the Transcaucasus is becoming increasingly intolerable. What will be the outcome of this, what could it lead to? This was the subject of special correspondent Major Aleksandr Krokhmalyuk's discussion with Colonel of Justice Viktor Kruk, an officer with the Russian Federation Procuracy's Chief Administration for Overseeing Compliance With Laws in the Russian Federation Armed Forces.

[Krokhmalyuk] Viktor Mikhaylovich, you just returned from Georgia. What is the mood among the Russian servicemen there?

[Kruk] Since that trip, I cannot shake a feeling of impending disaster. I witnessed the utter impotence of law and the authorities vis-a-vis the tyranny of the forces that are currently calling the shots in the Transcaucasus. Any sort of stability with respect to the situation of our forces in that region is utterly out of the question, at least until firm order is imposed there.

[Krokhmalyuk] What do you mean by the "forces calling the shots"?

[Kruk] In Georgia, for example, not one of the groups that represent government authority has a decisive advantage at present. Each one is trying to strengthen its position by creating various paramilitary formations. They have no clear-cut structure, single command system, or proper control. The actions of these formations are often determined by their field commanders.

[Krokhmalyuk] The Afghan scenario?

[Kruk] Something like it. All of them, as well as various bandit formations, share a heightened interest in Russian military units and installations. The vague status and jurisdiction of the latter, the uncertain terms and length of their presence there, and the lack of state-to-state agreements defining the status of our forces, have essentially deprived the servicemen and members of their families of all social and political rights, making them hostages to the political ambitions of various leaders and easy prey for all manner of armed formations. With the connivance and, often, approval of Georgian administrative bodies and local authorities, armed seizures of military compounds, depots, arsenals, freight, combat hardware, and other weapons of Russian forces have become more frequent and increasingly audacious. We have experienced the same thing in Azerbaijan and Armenia.

[Krokhmalyuk] Excuse me, Viktor Mikhaylovich, but that is a very serious assertion. Could you back it up with concrete facts?

[Kruk] Certainly. Suffice it to recall that in 1991-1992, the supreme executive government authorities of Azerbaijan and Georgia decided to nationalize all military property on the republics' territories. This created a kind of "legal basis" for actions against our forces. Here are just a few incidents.

On July 10, 1992, in Gyumri, Armenia, servicemen of the Armenian Defense Ministry's Shirak battalion shot Lieutenant Shapovalov and four soldiers. Investigative efforts made by officials of the Russian General Procuracy in the course of a joint investigation of the criminal case turned up evidence that Shirak battalion commander M. Vardanyan and his subordinates were guilty of the crime, as well as evidence that the Armenian Deputy Defense Minister, Major General A. Abramyan, was involved in that pre-planned operation. The Armenian Procuracy then refused to participate further in the joint investigation, and the guilty parties were never prosecuted. The leadership of the Russian General Procuracy twice requested that the Armenian Procurator General ensure the lawful and objective resolution of that case. However, no response was forthcoming.

In 1992 in Azerbaijan, republic law-enforcement agencies instituted criminal proceedings against Russian servicemen without even informing Russian government agencies. Do you remember? The Lukin case. There was also the case of Senior Lieutenant Simeon and a group of 10 soldiers accused by Azerbaijan of sabotage.

[Krokhmalyuk] But probably the most alarming news is coming out of Georgia.

[Kruk] The facts speak for themselves.

In September of last year, Georgian military police killed Private A. Chernov and Private M. Frank in Tbilisi, and Sergeant Yu. Lysov in Kutaisi as he was carrying out his official duties. Private A. Ponomarev was killed and Captain K. Yurovskikh was wounded in Tbilisi on October 30.

[Krokhmalyuk] What do you have to say about the seizure of Russian arms depots in Akhaltsikhe?

[Kruk] We have information that the arms and ammunition depots in Akhaltsikhe, as well as the stores depot of the 34th Air Army in Tbilisi, were seized on direct orders from the Republic Defense Minister.

[Krokhmalyuk] But this is outright brigandage. Can it be that Russia has taken no countermeasures?

[Kruk] Unfortunately, it has not. In December 1992, the Republic of Georgia National Security Council suspended the withdrawal of Russian forces' weapons from the republic. The Georgian side adopted this decision unilaterally. However, there was no appropriate response from the Russian government, and this in effect provoked a new wave of violence against Russian servicemen.

Twenty-two attacks on army installations with the aim of seizing their weapons, property, and equipment were recorded in January of this year alone. More than 600 such unprovoked armed attacks have been carried out

since 1991. Seventy-one Russian soldiers and members of their families have been killed, and 195 wounded. More than 25,000 small arms have been illegally confiscated, as well as more than 300,000 grenades, tens of millions of bullets, hundreds of vehicles, armored equipment, and heavy weapons. The material losses are in the billions of rubles and cannot be precisely tallied. For example, in a raid on January 21, 1993, on the Group of Forces' 336th Medical Depot in Tbilisi, Georgian militants seized more than 280,000 ampoules of narcotic substances, an undetermined quantity of other medicines and medical equipment, two kilograms of dental filling gold, and weapons. A sizable quantity of property was destroyed.

[Krokhmalyuk] In my opinion, it should be clear to any sober-minded person that such actions are utterly inexcusable. Can it be that the Georgian government fails to see this?

[Kruk] Georgian government agencies and law-enforcement agencies, while condemning these actions in word, are in practice taking no measures to stop them, investigate them, or prosecute the guilty. Our repeated requests to the Georgian General Procurator to this effect have gone unanswered.

[Krokhmalyuk] What about the command of the Group of Russian Forces in the Caucasus? Are its commanders too timid, as a poet put it?

[Kruk] The Group Command has been passive, and understandably so. The politicians have bound our military leadership in the Transcaucasus hand and foot. Any more or less decisive step taken by it will immediately be labeled a manifestation of Russia's "imperial policies." Moreover, the Group's command is rightly fearful for the lives of the servicemen's families. They are defenseless against arbitrary action by local authorities. Living among the local population, the wives and children of the officers and warrant officers are like hostages, subjected to discrimination, blackmail and threats of physical violence if the forces should take any action.

[Krokhmalyuk] But after Z. Gamsakhurdia was overthrown, E. Shevardnadze assured us of Georgia's "unchanged warm feelings" toward Russia.

[Kruk] If only that were really so! Unfortunately, we are observing the opposite. In the past few years, thanks to the republic's mass media and the activities of such political figures as Z. Gamsakhurdia, G. Chanturia, I. Tsereteli, N. Natadze, and others, public opinion has acquired a firm image of Russian soldiers as "occupation forces." Little has changed in attitudes toward the Russian Army since E. Shevardnadze came to power as leader of the State Council and then the Parliament. In effect, Russian soldiers in the Transcaucasus continue to have no rights.

[Krokhmalyuk] What is the situation in the social sphere?

[Kruk] The picture is the same. In Tbilisi alone, more than 1,000 families of officers and warrant officers have no apartments. Those who have housing are unable to privatize it, since the Georgian National Security Council prohibited privatization by Russian servicemen. The number of schools offering instruction in Russian has steadily declined. Even in the republic's capital, heating of apartments in winter is irregular. Supplies of hot water, electricity, and gas are intermittent. It is risky to go out on the streets after dark because of the danger of being killed by a stray bullet or assaulted by raging thugs. While 168 murders were committed in Georgia in 1985, the 1992 figure was almost 1,000.

Troop units at remote garrisons go for months without fresh bread. In the Akhalkalaki and Leninakan garrisons, where the temperature at night in winter reaches -25 to -30 degrees, electricity is available only four hours a day. There is no gas. There is a dire shortage of food.

It is virtually impossible for a servicemen to get local agencies to protect his rights. The value of the life, health, and personal safety of anyone in general, and of a Russian soldier in particular, has been devalued.

[Krokhmalyuk] When and how will this nightmare end?

[Kruk] I'm not a fortune teller. But in the meantime, the situation is heading toward greater bloodshed. To prevent the situation from reaching the critical point, it is essential that the highest government structures intervene. The Russian forces in the Transcaucasus are on the fault line, so to speak, of the raging political passions there. And Russia must show the utmost wisdom, firmness, and consistency if it is to emerge from the existing situation with dignity.

[Krokhmalyuk] Let's hope that our discussion serves as further impetus for this.

[Kruk] I would like to hope so.

[Krokhmalyuk] Thank you for speaking with me.

Nationalization Of Russian PVO Equipment In Georgia

93UM0036B Moscow ARMIYA in Russian No 11, 1993 pp 12-13

[Article by Colonel V. Simonov, former intelligence chief of former 19th Independent Air Defense Army: "Looted Army"]

[Text] Late last year, Georgia had a historic chance (I repeat: historic!) to obtain a well-established and effective air defense system without paying a kopek for it. The fact is that a decision was taken in Moscow at the highest level to disband the 19th Separate Air Defense Army and the Air Defense Missile and Artillery Battalion of the Group of Russian Troops in the Transcaucasus and to turn its infrastructure, equipment, and property over to

the Georgian Ministry of Defense. Still earlier, on July 22 1992, a directive of the Russian Armed Forces General Staff was signed on disbanding and transferring the Ochamchira Air Defense Missile and Artillery Training Ground.

It is important to note that in terms of air defense, Georgia was more fortunate than any other republic of the former Union. Its territory was home to the most highly developed infrastructure (command posts, weapon sites, airfields, and military compounds) and the highest density of air defense weaponry. For example, the territory of just 69,700 square kilometers had two air defense missile brigades, an air defense missile regiment, two fighter regiments, and two electronic warfare brigades from the 19th Separate Air Defense Army. [It also had] an air defense missile and artillery battalion that would have been deployed in wartime, an air defense missile brigade, an air defense missile regiment, two antiaircraft artillery regiments, an electronic warfare brigade, and an electronic warfare battalion from the Troop Grouping. Calculations showed that the republic's air defense installations were capable of striking a formidable blow to any airborne aggressor.

How was the "nationalization" of the Russian air defense installations planned and carried out? For example, the disbanding of the 19th Separate PVO Army was to have been completed by April 1 of this year. Four months were set aside to transfer the army's infrastructure, equipment, and property. During this period, plans called for smoothly transforming the army's structures into national ones, training young specialists in the rudiments of air defense, and finding officers of Georgian nationality who previously served in the Air Defense Forces or graduated from air defense schools. However, as soon as Moscow's decision was communicated to the Georgian Ministry of Defense, developments snowballed and took on an unpredictable character. "Nationalization" turned into ordinary looting of the air defense installations, as had happened earlier in Azerbaijan and Armenia. Unfortunately, the lessons of those countries went unlearned.

Here are the most characteristic examples. On the night of December 24, about 50 Georgian servicemen from the Shavnabad Special Forces Battalion surrounded and stormed the Seventh Battalion of the 144th Air Defense Missile Brigade. That battalion had virtually new equipment and everything necessary to carry out its combat mission of reliably protecting Tbilisi from the southern and southwestern air sectors. It lacked only personnel—just two unarmed officers remained at the installation, and they had simply nowhere to go. The storming was carried out from all directions, with a preliminary "taking out of the sentry." But what the Georgian special forces thought was a sentry was actually a statue of Lenin with an outstretched arm. One of the attackers couldn't contain himself and fired a round from his assault rifle at the statue. From that point on, the typical scenario unfolded: An entire night and day was spent looting and hauling off trophies. The officers were relieved of their personal funds (21,000 rubles), scarves, electric razors, alarm clock, Mayak radio, an electric oven, sneakers, and even canned goods that were part of their rations. Of the equipment, the Georgians took every vehicle that was running and everything that could be towed by their trucks. The special forces took 16 S-125 surface-to-air missiles and two launchers. Incidentally, the latter were abandoned along the road; the missiles, intelligence sources reported, were to be sold privately to the Armenians. None of the Georgians were concerned about the fate of their country, only about personal gain. Two weeks later, nothing remained of the battalion—the local population had dismantled the barracks and apartment buildings all the way down to the foundations. For the record, equipping and siting the air defense missile battalion cost 100 million rubles in 1991 prices.

It is significant that the air defense battalion's commanding officer, Colonel Ye. Ivolgin, officially notified Mr. Tengiz Kitovani of the looting of the Seventh Battalion on January 5, but the Georgian Defense Minister refused to discuss the issue. Apparently, the action had been carried out with the knowledge of senior officials. The destruction continued. On February 2, 17 Georgian special forces personnel attacked the Ninth Battalion of the same brigade. The battalion suffered the same fate as several other units and subunits of Russian forces in the Transcaucasus.

It took armed Georgian formations six months to totally plunder a training and equipment base for air defense specialists—the Ochamchira Air Defense Missile and Artillery Training Ground. Four military compounds ceased to exist, as did a field camp and various training facilities at the facility.

This author watched how the Georgian servicemen occupied the staff of the 19th Separate Air Defense Army in early January. What were they most interested in? Mainly the telephones and air conditioners. The most valuable piece of equipment at the headquarters—the computer center and all its software—interested no one.

The question arises: Why destroy something that had already been created? Surely Georgia needs a well-established defense zone. That is why the system was created; after all, airspace has to be monitored. Mistakes always exact a price, sometimes a very high one. And so in the near future life will force Georgian taxpayers to cough up funds to rebuild the destroyed air defense system.

Some comparisons are helpful. For example, Kuwait, with only one-third of Georgia's territory and population, is setting up a national air defense system. In March 1991 that country purchased a Patriot surface-to-air missile system (eight launch tubes) from the United States for $350 million. In the next year, that country, in conjunction with an American firm, intends to deploy an early-warning and airspace-monitoring radar system. Equipping the system is expected to cost $92 million.

Establishing a new air defense system will require of Georgia enormous outlays that will long be beyond the wherewithal of its economy. And Western countries are hardly likely to supply hundreds of dollars' worth of weapons and equipment for nothing. And Georgia is certain to need air defense missile systems, radar stations, computerized control systems, and a great deal of other supporting equipment that is very costly.

And so let us tally the result. The "nationalization" of Russian air defense installations has not enhanced Georgia's defense capability or enriched that country. On the contrary, the republic finds itself in a very difficult situation. There is a constant threat that its territory could be attacked from the air with impunity, that acts of terrorism could be carried out, and that its economy could be undermined via the transport of contraband by air. Delivering "goods" to any part of the republic will now be far easier, safer, and more economical by air than by land. The republic cannot monitor its airspace, and without this it cannot be an independent state.

History will put everything in its place. It will show who was right and who was wrong.

ARMS TRADE

Russian 'Debut' at Ankara Weapons Exhibition Successful

944Q0014A Moscow KOMMERSANT in Russian No 38, 27 Sep 93 p 10

[Article by Alla Glebova: "Yes! We Need the Turkish Shores: The Weapons Exhibition in Turkey"]

[Text] **If you ask any director of a Russian military-industrial enterprise exhibiting its products on 14-19 September at the IDEF-93 international exhibition in Ankara why he came to Turkey, you will get the same answer: "To find a source of finance."**

The debut of Russian weapons and military technology in Ankara was a success. Russian firms received many commercial offers from foreign companies. A protocol was signed which envisages further expansion of cooperation in the military sphere between Russia and Turkey. Both sides hope that during the visit to Moscow by Turkish Minister of National Defense Nevzat Ayaz, which will take place at the beginning of October, a number of agreements will be signed in the area of military-technical cooperation.

Unlike the IDEX-92 exhibition in Abu-Dhabi, where combat capabilities of military equipment were demonstrated, IDEF-93 was a quiet exhibition for specialists. What in Abu-Dhabi produced a menacing military rumble was presented in Ankara in the form of models, charts, and videos. The Russian exposition in Ankara was organized by the state company Spetsvheshtekhnika—the former technical administration of the USSR GKES [State Committee for Economic Cooperation], which controlled all military construction projects, maintenance of military equipment, and technical training abroad.

Spetsvheshtekhnika is planning to open a representation in Ankara soon. Meanwhile, military-industrial companies of the United States and European NATO countries remain unchallenged in the Turkish market. Among the exhibition participants were such giants as the U.S. companies Boeing Defense and Space Group, General Dynamics, United Technologies/Sikorsky Aircraft; British—Marconi Defence Systems, Ltd., Defence Manufacturers Association, and Defence Export Services Organisation; and French—Thomson-CSF and Aerospatiale. They do not have to make too much of an effort to move their products in Turkey, and these world giants of military industry were represented in the melting-point hot pavilions of the exhibition complex in Ankara by minute, albeit colorful, expositions. They did not bring their latest designs to Turkey.

Meanwhile, Russia is compelled to take an extremely aggressive marketing position. Judging by comments by managers and specialists and the abundance of commercial contacts, the Russian presentations have found their mark. The Russian pavilion also was the one most attended by official persons—the prime minister, the Turkish president, the minister of defense, and the Air Force commander in chief began their tour of the exhibition there.

'Aside From the Russian Exposition, I Did Not See Anything New...'

This is what Tunkai Akel, general manager of the NEMA company—one of the 10 largest Turkish industrial companies—told a KOMMERSANT correspondent. Russian industry entered the exhibition with a broad range of products. Among the exhibits were helicopters made at the Imeni Kamova NPK [scientific-industrial combine] and Imeni Milya Moscow military plant, the Piranya miniature submarine and Triton miniature submersible, missile and patrol cutters, shell mines, helicopter-drawn trawl, and designs for marine engineering structures; Tunguska antiaircraft gun-and-missile system; Buk-M1 antiaircraft missile system and Shmel drone; Shtora and Arena tank defense systems; guided armaments for artillery—Krasnopol, Smelchak, and Kitolov-2 systems; Metis-M and Konkurs-M antitank systems; reloadable and disposable grenade-launchers, Shmel rocket launcher; equipment for the detection, isolation, and destruction of explosives and explosive devices; and firearms. Spetsvheshtekhnika presented a large number of engineering and construction designs—for instance, an explosives and explosive devices production plant, a design for a super-heavy floating pier, and Tsiklolift—a unique technology for ship recovery. The full list of Russian presentations would have taken many pages.

Leafing through the log of commercial offers, in which the Spetsvheshtekhnika staff wrote down information about those who had shown an interest in the Russian exposition, one could not miss the fact that all the proposals involve joint design. The Americans, the French, the British, the Germans, and companies from the Middle East would like to jointly develop mine-and-torpedo armaments, armor-piercing shells and methods of storing explosives, and build heavy marine piers, missile and patrol cutters, Piranya-class miniature submarines, and unique helicopter-drawn trawls in third countries. Judging by the interest shown by foreign companies, we should expect a fast increase in cooperative efforts in the area of military shipbuilding and marine armaments.

In addition to new generation technologies, Russia brought to the exhibition the legendary weapons that have remained in production (with some modification) for decades—such as, for instance, the Kalashnikov firearms.

Aleksandr Likhachev, director general of the Kalashnikov AO [joint-stock company], which brought Udmurtia's arms makers under the umbrella of the Izhevsk Machine Works, can finalize a contract with the company seal at any time, should he wish to. He always has the company seal with him, and the government of Russia has granted the Kalashnikov AO the right to sign

direct contracts until the end of 1993. One can see with the naked eye that there is great interest in the company's product. But Likhachev is in no hurry to pull out his seal: "I cannot sign contracts at dumping prices. Imagine: We are offered $80 per unit for brand-name weapons—for instance, a sniper rifle." One could spot those who bring the Kalashnikov AO's prices down, right there in the exhibition pavilions. Bulgarian, Polish, and Romanian display stands featured slightly modified AK-47, AK-74, AKMS, and AKSU of various calibers, including the NATO standard. But while Bulgarian and Polish firms show the name of the original maker, the Romanian company Ratmil does not feel obligated to do even this much. Actually, all of this is the logical result of the practice of the recent Soviet past, when the USSR gave away everything, including oil and arms, right and left.

Vyacheslav Abanin, director of the Ulyanovsk Mechanical Plant (UMZ), made quite a splash in Ankara by comparing Turkish Prime Minister Tansu Ciller with the Tunguska antiaircraft gun-and-missile system. The youngest director in the Russian VPK [military-industrial complex] was prompted to such a risky comparison by the need to draw the prime minister's attention to the UMZ's armored offspring, since the future of military production today practically completely depends on whether it has customers willing to pay hard currency.

There Is No Money in Russia, and There Will Not Be

Of the 700 billion rubles [R] promised for conversion in 1993, so far only R50 billion have been appropriated. In the absence of financing, military plants produce whatever they can. For instance, the same UMZ, manufacturer of the famous Tunguska and Buk systems, now has a monopoly on production of medical sterilizers of its own design, which are in great demand; it also owns 4,000 hectares of plowed land; is developing on commission from Aeroflot a landing system for category 3 air fields; is participating in financing the development of communication systems utilizing high-voltage power lines (the L-comm); and is setting up a trading house to sell coffee and tea, which UMZ receives as in-kind payment from India for its products.

Turkey Is Ready To Buy; Mostly Technology

"Where have you been before?" Tunkay Akel asked the Russian organizers at the exhibition. He also added: "The most important point is not that our company is influential and rich. The important thing is that we are willing to invest, to buy Russian licenses and technologies."

This wording is not accidental. Like most other countries possessing military industry, Turkey prefers cooperative production and purchasing licenses over the mere importation of ready-to-use military equipment. Specialists believe that many Turkish companies undoubtedly have the moral right to bring up the issue of cooperative effort. For instance, according to Aleksandr Petrov, head of the industrial communications department, "the Turkish exhibit in the communications area, in particular that of the Aselsan Company, shows that with the help of American and West European technologies Turkish industry has put into production almost the entire range of communication systems and means needed by the armed forces."

Turkey is a large and promising market for the distribution of armaments and production technologies. The Turkish army is the second most numerous in NATO after the United States (approximately 560,000 men, with a population of 58 million). In the opinion of specialists of the All-Russia Institute for Intersectoral Information, the "bottlenecks" in the Turkish army are the supply of modern ammunition for artillery and firearms, armor protection for currently used tanks, and modernization of the PVO [antiaircraft defense] system. Turkey wants to set up the production of infantry fighting vehicles; neither does it have yet army combat helicopters and dual-purpose helicopters. In addition, Turkey intends to buy remote-controlled flying apparatus, mine-sweepers, and high-speed coast guard cutters. The government plans to equip the armed forces with modern equipment for rapid-deployment operations, which will make the Turkish army more mobile.

"In a conversation with representatives of the Russian delegation, Turkish military authorities emphasized several times that being a NATO country, Turkey will not make major decisions regarding purchases of new weaponry without consultation with its allies in the bloc," says Boris Lapshov, deputy chairman of the Russian Defense Industry Committee and a member of the Russian government delegation at the Ankara exhibition. Although, on the other hand, according to Frants Markovskiy (a colonel general, chief of the Main Administration for International Military Cooperation of the Russian Federation Ministry of Defense), "NATO is no longer our enemy," and Turkish Minister of Defense Nevzat Ayaz said at the exhibition's opening that political changes in Russia are providing Turkey with an impetus to seriously consider opportunities for military-industrial cooperation with Moscow.

Overall, the prospects for developing such cooperation are quite favorable. One can count as an opening in this area the contract signed at the end of last year between the Turkish MVD [Ministry of Internal Affairs] and the Russian Spetsvheshtekhnika—a state foreign economic company engaged in export and import of armaments and military equipment—for the delivery of 70 Mi-8 transport helicopters, a shipment of Kalashnikov automatic rifles, and armored personnel carriers. Currently in preparation for the Turkish minister of defense's visit to Moscow, working groups headed by specialists from the Russian Defense Industry Committee are already busy working out a number of bilateral military-technical agreements that take into account the commercial contacts developed at the Ankara exhibition.

[Boxed item]

Our Parachutes Will Support European Prestige

It happened over time that flying craft had pride of place in the domestic air and space complex. Against this background, design and manufacture of parachutes did not seem very prestigious, and the only designer and manufacturer of parachute systems in the USSR—the Parachutebuilding NII [Scientific Research Institute]—for a long time remained in the shadows. Nevertheless, this institute's debut in the world market was a huge success—at the end of June of this year the institute won the European Space Agency bid to develop and manufacture a system for the recovery of the Ariana-5 booster rocket's propulsion system. Last week the Russian designers completed technical discussions on the project with the direct customer—the Dutch company Fokker Space & Systems.

Russia could not participate directly in the European Space Agency bidding, since it is not a member. Therefore, the Parachutebuilding Institute presented technical proposals for the Ariana-5 project jointly with its partner C.I.M.S.A. (a private Spanish firm that had been in the business of designing and manufacturing parachute systems for more than 50 years); a temporary business venture was created specifically for this purpose in April 1993.

European and American firms also participated in the bid. Oleg Rysev, director of the Parachutebuilding Institute, explains its success by the fact that none of the bid participants currently have such practical experience in developing space recovery systems. This institute developed all the parachute systems for spacecraft that exist in Russia. In the opinion of Mr. Rysev, in this area of parachute technology Russian developers have no equal in Europe.

By the terms of the contract signed between Fokker Space & Systems and the C.I.M.S.A.-Parachutebuilding Institute temporary venture, after the development, design, and testing of the recovery system is completed, the Parachutebuilding Institute will deliver two systems for the first two launches under the Ariana-5 program. The first launch is scheduled for October 1995. According to the developers, the attractiveness of the technology lies in the successful combination of technological innovation and mathematical analysis of parachute behavior. Actually, this methodology will remain the institute's property. Only finished products will be delivered.

The institute does not intend to stop at the Ariana-5 project. The institute's experimental production will continue to supply braking parachutes to military aircraft destined for export and will increase the production of sport and recreation parachutes.

[end box]

DOCTRINAL ISSUES

Litvinov on Post Cold War Nuclear Era

94UM0037A Moscow ARMIYA in Russian No 11, 1993 pp 27-30

[Article by B. Litvinov: "The 'Cold War' Is Still Frosty. Notes of a Chief Designer—From Nuclear Parity to the Principle of Parity; Trust Without Borders. How to Divide the Nuclear Legacy? Is a Golden Era Coming?" first paragraph is ARMIYA introduction]

[Text] The author, Boris Vasilyevich Litvinov, was born in 1929. He works as a chief designer at the All-Russian Scientific Research Institute for Technical Physics. He is a corresponding member of the Russian Academy of Sciences, a past winner of the Lenin Prize and many other state awards, and a Hero of Socialist Labor. He is being published for the first time in our journal.

The "cold war" has ended, making the threat of nuclear war more remote. This fact must later be assessed by historians. They must assess it objectively, comprehensively, and in full. I would not be in a hurry to recognize the defeat of Russia, just as I would not honor the "victor of the tournament": The hands of the nuclear epoch do not yet point to a time without danger.

We were gripped by the painfully difficult process of rethinking what would seem to be customary concepts for us having to do with nuclear armament. Practically the first of these concepts that must be given new meaning is that of nuclear parity.

The Military Encyclopedic Dictionary from 1983 treats it this way: "Nuclear parity, the preservation of approximate equality of the capabilities of nuclear systems and weapon systems of **opposing** (my emphasis—B.L.) sides for the purpose of equal security. The principle of nuclear parity was applied in the SALT I and SALT II treaties between the USSR and the United States." Thus, the definition of nuclear parity unequivocally links the provision of the security of the two opposing or, better, antagonistic sides with the approximate equality of nuclear forces. Yes indeed, fortunately it did not come to a nuclear war between the United States and the USSR but security was guaranteed through a wasteful arms race that is more characteristic of a state of war than of peace. This competition over decades led to a dead end, and one of the ways out of it was the signing of the SALT I and SALT II treaties. The documents established the fact that in the "tournament of opposition" of the two superpowers, neither had yielded to the other, but this was achieved at the price of gigantic expenditures. With the disappearance of one of the superpowers, what remained to commemorate nuclear parity was mountains of weapons and uncertainty. What should be done with them? The good cause of disarmament was like an avalanche in nature and generated numerous problems, above all for Russia. But we will discuss them somewhat later.

Since Russia does not intend to oppose the United States and its allies, then nuclear parity, just as other outcomes of the "cold war," is becoming an anachronism. The alternative to the undesirable development of the peace process can be either the universal and complete disarmament of all states that possess nuclear weapons or the transfer of the right to manage the nuclear military potential to the UN Security Council, in which it will be necessary to grant more rights to countries that have never possessed superweapons.

It is possible that these proposals now sound utopian, but only with the introduction of an international system for the management of nuclear weapons will it be possible to speak of real international nuclear parity; that it, of the right of all countries of the earth to deal with nuclear weapons, including even their complete destruction. As long as nuclear weapons are in the hands of the politicians of individual countries or a group of countries, it will not be possible to assert that nuclear weapons guarantee stability and equal security for all countries.

Thus, time has made some perceptible changes in the concept of nuclear parity. It is now necessary that the previous desires to test each other's strengths not be revived through nostalgia for the former nuclear parity between the United States and Russia.

The cessation of the "cold war" does not immediately reverse the mistrust and suspicion that existed between rivals. The alternative is friendly relations between countries expressed in the most diverse official and unofficial contacts of people of diverse levels and positions. It is customary to secure the desire to establish good relations through the corresponding agreements and treaties with some degree or other of verification of their observance. Certainly, this also applies to the treaties on nuclear weapons, although here the question of verification is not as simple as it may seem to the unitiated. The matter is especially complex with respect to verification in the area of nuclear disarmament. Of course, the more mutual understanding and trust there is between the negotiating sides, the less significant will be the procedures of formal verification, because verification in any of its forms is an expression of mistrust toward the side being monitored. But as yet, very little time has passed under the new reciprocal relations between the United States and Russia in the area of nuclear disarmament. And there is too much mistrust, for the "new political thinking" has not yet displaced or abolished the psychology of confrontation. Not for either side. Our American colleagues, for example, are greatly tempted to elucidate how it is that we Soviet nuclear physicists were able to keep from falling behind the basic characteristics of their nuclear weapons despite our lack of contact with representatives of foreign science and a well-known backwardness in computer technology. Transoceanic experts judge that our level of technical achievements is no lower than that of the Americans from indirect data, including data obtained as a result of the technical monitoring of nuclear tests and, I assume, during the time of the mutual monitoring of the disarmament process. At the same time, the Nonproliferation of Nuclear Weapons Treaty forbids giving information on the structure of nuclear warheads. Accordingly, in expanding confidence-building measures and agreeing with the carrying out of technical monitoring, it is necessary to permit it only in those forms that are nonintrusive, that is, do not reveal more than is allowed under the treaty. It is understandable that such good intentions in the development of future projects for the mutual reduction of arms do not raise mutual trust. The signing of the well-known agreements was most often based on the principle that a bad peace is better than a good quarrel.

It is necessary to approach the problem of the disarmament of Russia from the point of view of national interests. The dialectics of foreign political processes is such that our federation simultaneously has to strengthen mutual trust and its armed forces. When the relations in the world, including in the CIS, become better defined, it will be possible to decide what should be given preference: Trust without a nuclear missile shield or trust with the shield.

As life has shown, the possession of nuclear weapons not only provides a dependable defense, but also involves a potential danger for close and more remote neighbors and for the population of the country possessing the absolute weapon. The fact is that nuclear weapons are not simply a technical system, but a system of man and equipment. And it is the behavior of man that is most unpredictable in such complex systems. Therefore, the most important condition for the functioning of a huge destructive system is the reduction of the negative influence of man on it to a minimum.

Just as any kind of combat equipment, nuclear weapons can fall into different emergency situations and be subject to sabotage. The possibility and reality of the onset of critical situations are different aspects of the problem of the security of nuclear weapons. It must be noted that domestic scientists and engineers created systems that are practically invincible against nonstandard conditions. As was shown over a period of more than 40 years, there was not a single serious accident either in production or in test explosions. But, I repeat that technically advanced insurance systems cannot guarantee security 100 percent under the conditions of a tense social and political situation. And this is still another argument in favor of the elimination of nuclear weapons.

Having more than a passing knowledge of the possibilities of nuclear arsenals, I still get chilled by the "cold war," when modern-day politicians superficially judge the threat of planetary annihilation as having become more remote for mankind. With an increase in the number and diversity of nuclear weapons, their danger becomes greater, because the law of large numbers begins to take effect: There is an increase in the number of such dangerous operations as loading and unloading, transportation, verification, etc. Naturally this complicates the procedure for monitoring the safe course of the work

The quantitive increase in the absolute weapon undermines security not only within the country but also outside of it, initiating an unrestrained arms race and increasing international instability. Bilateral or multilateral disarmament, on the contrary, strengthens trust and increases the stability of the world and its security. But the pace and order of disarmament, that is, the sequence of the removal of particular kinds of weapons of mass destruction cannot be arbitrary.

In contrast to conventional arms, which can be destroyed through demolition, nuclear weapons must be disassembled into their component parts. Underground blasts are too expensive, and to be safe this process requires much more time than disassembly. But the dismantling of a nuclear warhead is an incomparably more dangerous operation than is assembly. This process is so complicated and the danger so great that the comparison with a combat engineer who makes a mistake one time...is simply out of place. Precisely for this reason disassembly also dictates the pace of the elimination of nuclear weapons.

There is still another circumstance that slows the pace of disarmament and the elimination of nuclear weapons. After disassembly, fissionable materials remain, which must be stowed in their individual packaging so that their mass in one package (container) is subcritical. This requires a significant quantity of containers for the fissionable materials and new warehousing premises. And all of this is lacking in Russia at this time. It must be produced and this takes time.

I intentionally undertake such a detailed digression into the area of technical and economic problems so that the authors of far-reaching political decisions and popular international actions will understand that disarmament must proceed in its natural evolutionary time. Acute problems of a planetary scope cannot be resolved in the pace of previous slogans like "a five-year plan in four years."

Nor must one fail to note the circumstance that it appears that the West is encouraging the process of our rapid disarmament. One gets the impression that only our nuclear weapons are a threat to peace and its stability. Very little is known about the realization of the so-called "Bush-initiative" and it may be that it will not come to its practical implementation and this likewise will hardly increase trust and mutual understanding.

Alas—and this has become a sad reality—unilateral disarmament, in contrast to the arms race, has unfortunately never been the cause of reciprocal initiatives of our negotiating partners. Proof of this is our moratoria on nuclear tests, the withdrawal of our forces from the territory of the former participating countries of the Warsaw Pact, and the unmotivated haste of nuclear disarmament. It is unclear whether this will strengthen trust in us. But specialists have no doubt that crash disarmament is an action that is costly and not without danger.

The unprecedented power of nuclear weapons combined with the capability of intercontinental ballistic missiles to reach any point on earth has practically made every country on earth defenseless. In my opinion, the realization of this unpleasant circumstance was the main reason why the USSR and United States initiated measures at the beginning of the 1960's to prevent the appearance of nuclear weapons in states that did not yet have them at that time. There were several versions of a treaty on the nonproliferation of nuclear weapons, which after careful discussion became the basis of a project approved by an overwhelming number of participants in the UN General Assembly on 12 June 1968. The Nonproliferation of Nuclear Weapons Treaty was open for signing by all countries beginning 1 June 1968 in the capitals of the depositary countries of the treaty—Moscow, Washington, and London. We note that not all countries have participated in the treaty, including such members of the nuclear club as France and China.

We are reminded that Article I of the Treaty obligates states possessing nuclear weapons not to transfer nuclear weapons or other nuclear devices or the control over such weapons or other nuclear explosive devices to anyone either directly or indirectly. According to this article, therefore, nuclear weapons or any nuclear device must not be transferred to an individual state, physical or legal person, or alliances or multilateral associations of states. The disintegration of the USSR created a very complex problem. On the one hand, any one of the 15 republics of the former Soviet Union seemingly would have the right to its own nuclear weapons but, on the other hand, the recognition of this right by the international community would mean a very gross violation of the Nonproliferation Treaty. Russia declared itself the legal successor of all the obligations of the USSR relative to nuclear weapons. But the incompleteness of the process of the legalization of the rights of the Russian Federation as the sole possessor of the nuclear weapons of the former USSR creates a dangerous precedent of a violation of the Nonproliferation Treaty, under which a group of states cannot possess nuclear weapons. This is one of the problems of nonproliferation at the present time that is not being discussed but nevertheless exists not only for the inhabitants of one-sixth of the territory of the earth, but also for the entire world.

There is much broader discussion of other problems of nonproliferation that are very topical, in the opinion of some circles in the United States and other Western countries. They are the problems of the exclusion of nuclear weapons from the arsenals of Ukraine, Kazakhstan, and Belarus and the elimination of the possibility of the transfer of warheads or weapons-grade uranium and plutonium from these republics to developing countries. It is obvious that the declaration by persons in the army responsible for the storage of nuclear weapons that as of 5 May 1992 all tactical nuclear weapons had been removed to Russia from all the states of the CIS greatly calmed the public within the countries of the CIS and in the West.

The public in the West considers the possibility of Russian nuclear weapons specialists going to third countries to be an acute problem. Nor is such a possibility denied by Russian nuclear physicists, especially those of them who never dealt with nuclear warheads or nuclear munitions. The circle of people who really know how to make one or the other on the basis of their specialization is quite limited and I do not know of even one instance of the departure of specialists from this circle, the real bearers of sacremental knowledge, to other countries. All of the known facts of the "drain" of nuclear experts abroad that the press has reported have to do with institutes that deal with nuclear-energy research such as the Atomic Energy Institute, for example. As for my colleagues, they do not have the kind of frivolous attitude toward a change in their place of residence and work that is very prevalent in Western countries. At the same time, it must be noted that a situation is arising in Russia that may force Russian experts on nuclear weapons to change if not their place of residence, then their line of work. On the one hand, both federal nuclear centers of Russia—the VNIIEF [All-Union Scientific Research Institute of Energy and Physics] (Arzamas-16) and the VNIITF (Chelyabinsk-70) are experiencing great financial difficulties. On the other hand, in Moscow they are finishing work on an International Scientific-Technical Center (MNTTs), the purpose of which will be the "reduction of incentives for the proliferation of technologies for weapons of mass destruction to a minimum" (from the "Statute on the MNTTs"). Behind this formulation is the resolution of the idea of diverting our nuclear specialists from the development of nuclear weapons and nuclear warheads so that the disarmament of Russia will take place not only through the elimination of nuclear arsenals but also through the removal of unique nuclear weapons specialists in Russia. It is clear that it was also with this purpose that the West created the myth of the willingness of Russian weapons specialists to leave for third countries.

Leading nuclear specialists throughout the world are expressing concern about a danger related to weapons of mass destruction—the growing stockpiling of plutonium, a product of nuclear reactors at nuclear power stations. Indeed, the further development of nuclear energy will make it more difficult to account for this product and will create new aspects of the problem of the nonproliferation of nuclear weapons. This does not at all mean that the author opposes the construction of nuclear power stations. On the contrary, I see no alternative to nuclear energy in the next few decades. Talk to the effect that thermonuclear energy sources will replace nuclear power stations is groundless at this time: Real success in this area has been quite modest, if one judges by some measure other than expenditures.

In its time, the development of nuclear technologies and arms was an unprecedented leap in the development and utilization of fundamental and applied knowledge, which gave reason to call the 20th century the "atomic age." It would seem that precisely this leap in new knowledge should have been the basis for an unusual surge in civilian industry and the beginning of a new "golden age." But this did not happen. Nuclear technologies found practically no application in nonmilitary sectors of industry. Their appearance merely divided the world into nuclear and nonnuclear parts, for the possession of the entire totality of knowledge and know-how having to do with this area of human activity was possible only for a small number of industrially developed countries. And even they experienced serious accidents and disasters that showed that people had not yet fully mastered nuclear technologies. In addition, the enormous potential of the nuclear weapons of the United States and the USSR always caused understandable worry in the nations. The obvious necessity of reducing this potential was realized back in the 1970's. It became clear at that time that there would be no victors in a world nuclear war. It seemed that everyone would soon understand that nuclear explosive devices had to be retained only for peaceful industrial use and scientific research. But the appearance of neutron weapons and long-range cruise missiles that were practically invulnerable to air defense systems and the development of SDI programs gave impetus to a new round of the arms race. They halted it in the USSR so resolutely that work on nuclear arms was slowed to a complete standstill in some areas.

It became clear to us around 1987 that the enormous possibilities of nuclear technologies and the reserve of knowledge and know-how can be made the basis for a powerful push toward scientific-technical progress. In 1988, we began a sluggish and very unorganized transition to conversion work. It was suggested to the institutes that they find science-intensive areas in which to apply their knowledge. At the same time, it frequently happened that the criterion for science-intensiveness was not the dispassionate and qualified expert appraisal of proposed projects, but the notions of ministerial officials about the importance of these projects. It may be said that the choice of the ways to conversion ended in 1990 for most institutes and enterprises dealing with military nuclear technologies. The intensive adoption of knowledge acquired in the creation of nuclear weapons began promising a real technological leap. By the end of 1991, however, the financing of conversion work (and also of military work) began to decline catastrophically. The prices for all materials crept upward, and the volume of these materials produced went down. The work continued in 1992 but the pace was critically slow. There is not enough money to buy the most necessary items. The transition to conversion work revealed the necessity of acquiring new equipment that formerly was not used here, of assimilating new materials and technological processes, and of new construction or reconstruction of old production buildings. All of this requires new capital investments, of which there is not enough for the most urgent projects; not to mention the fact that the employees did not always receive their wages in time and in full.

Essentially, the enormous possibilities of the scientific-technical potential of nuclear technologies and arms

remain unclaimed. With the capitulation of the "cold war" began the stagnation and degradation of the atomic industry, one of the most science-intensive industrial branches that once promoted progress.

Doubtless the end of the "cold war" gave humanity the desired release from the threatened confrontation of two superpowers. But it gave rise to many other very acute problems of nuclear weapons that are solvable. We just need time to interpret and select the optimum solution. The priority tasks, in my view, are these: Finding the place of Russia's nuclear forces in the resolution of geopolitical tasks and the determination of the composition of the nuclear forces; and, accordingly, the time needed for their transformation, including the transformation of the scientific-technical support of new developments and the modernization of old ones. These urgent problems should be resolved in the interests of Russia and by the forces of Russia.

Development of Subunit Tactics for Meeting Engagement

94UM00294 Moscow VOYENNYY VESTNIK in Russian No 6, Jun 93 (Signed to press 21 May 93) pp 33-37

[Article by Candidate of Historical Sciences, Lecturer, Colonel R. Valentinov: "On the Cutting Edge of a Meeting Strike (Development of Subunit Tactics in a Meeting Engagement")]

[Text] The meeting engagement, as a variety of an offensive engagement in which both sides seek to accomplish assigned missions through an offensive, has been well known for quite a long time. But until the middle 1930's, the issues of its organization were not examined in the guiding documents of the Red Army. The possibility of a surprise encounter with the enemy on the march was only mentioned in the 1925 RKKA [Workers' and Peasants' Red Army] Interim Field Service Regulations, and conclusions were made on the need for reconnaissance and a guard detachment. But then again, an entire chapter was devoted to the meeting engagement in the 1936 RKKA Field Service Regulations. Still more attention was devoted to it in the draft 1939 Red Army Field Service Regulations. However, many theoretical provisions also remained untested in practice, which had a negative impact during the course of combat operations at the beginning of the Great Patriotic War.

The first battles near the Western borders of the USSR already provided a multitude of examples of meeting engagements, the majority of which ended unsuccessfully for Soviet troops. The enemy, having superiority in the air and superiority in maneuverability, detected in a timely manner the columns that were advancing from the depth, prevented them from deploying, and inflicted surprise, flanking strikes. Our commanders mastered the art of the meeting engagement and, skillfully employing its various techniques, attained significant tactical successes only in the second and third periods of the war.

In the postwar years, the scale and dynamic nature of combat operations dramatically increased as a result of the increase of fire and maneuvering capabilities of units and subunits, and the appearance of nuclear and then precision-guided weapons. As a result, favorable conditions were created for the emergence of the meeting engagement in all types of troop activities: On the march in offense, in defense, and during a withdrawal. All of this required introducing definite adjustments in theoretical views on this issue.

First of all, views changed on the **composition and distance of the advance guard (forward detachment) and troop march security elements in anticipation of a meeting engagement (see the table).**

Moreover, beginning from the 1950's, flank security elements (BPZ) of up to platoon strength, that advanced at the level of the head of the column of the main force at a distance of 3-5 kilometers, began to be assigned to guard the advance guard. If necessary, a patrol squad or a tank, both along the route of travel and also on the side of the exposed flank, were allocated from the flank security element.

Composition and Distance of the Advance Guard (Forward Detachment) and Troop Security Elements on the March in Anticipation of a Meeting Engagement in the Postwar Years (1945-1990)

Period	Advance Guard (Forward Detachment)		Advance Party (GPZ)		Point of the Advance Guard (GD)		Patrol Squad (Patrol Vehicle)	
	Composition	Distance From the Unit Main Force (km)	Composition	Distance From the Advance Guard (km)	Composition	Distance From the Advance Party (km)	Composition	Distance From the Advance Party (Point of the Advance Guard) (km)
1945-1953	a rifle battalion in vehicles, T-34 tank company (SU-100 [100-mm assault gun] battery), 57-mm PTP [antitank gun] battery, mortar battery, ZPU [antiaircraft machinegun mount] platoon, combat engineer platoon	5-8	a rifle company in vehicles, a tank platoon (SU-100 battery), a mortar platoon, antitank gun platoon, and a combat engineer squad	2-3	—	—	a rifle squad in a vehicle	up to 1
The 1950's	a rifle battalion in BTR-40's, a T-54 (55) tank company, a 122-mm howitzer battery, a mortar battery, a 57-mm antitank gun battery, an antiaircraft machinegun mount platoon, a combat engineer platoon	6-12	a rifle company in BTR's, a tank platoon, a 122-mm howitzer platoon, a mortar platoon, an antitank gun platoon, an antiaircraft machinegun crew, and a combat engineer squad	3-6	—	—	a rifle squad in a BTR (tank)	up to 1.5
The 1960's	a motorized-rifle battalion in BTR-60PB's, a T-62 tank company, a 122-mm howitzer battalion, an antitank guided missile battery, an antiaircraft missile platoon, a combat engineer platoon	20-30 (up to 50)	a motorized-rifle company in BTR's, a tank platoon, a 122-mm howitzer battery, an antiaircraft missile crew, and a combat engineer squad	5-10	—	—	a motorized-rifle squad in a BTR (tank)	up to 1.5
End of the 1970's-1980's	a motorized-rifle battalion in BMP's, a T-72 company, a self-propelled artillery battalion, an antitank guided missile battery, an antiaircraft missile battery, a combat engineer platoon	20-30 (up to 40)	a motorized-rifle company in BMP's, a tank platoon, a self-propelled artillery battery, an antiaircraft missile crew, and a combat engineer squad	5-10	a motorized-rifle platoon in BMP's (tank platoon)	3-5	a motorized-rifle squad in a BMP (tank)	4-6 (up to 1.5 t)

As a consequence, the subunits assigned to the advance guard gradually acquired high fire and strike force and also, which is especially important, were completely transferred to a self-propelled armor base. A ramified network and the increased maneuverability of the march security elements permitted them to ascertain, in a timely manner, an enemy advance at a significantly greater distance than previously and to ensure the timely deployment and entry into an engagement of the advance guard's main force.

Changes also followed **in the formation of their column.** For instance, if there was a rifle company in vehicles at the head at the end of the 1940's after which the attached tanks or SU-100's followed and the artillery traveled behind another rifle company in the rear, the 1953 Soviet Army Field Service Regulations already stipulated having the tanks ahead and the artillery in the middle of the column. Subsequently, with the appearance of PTUR [antitank guided missile] combat vehicles, the antitank subunit began to be deployed ahead of the tanks behind which all of the field and antiaircraft artillery were moved. Motorized-rifle companies in BTR's [armored transport vehicles] were at the rear of the main force column (Soviet Army Field Service Regulations, Part 2, 1964). At the end of the 1970's and in the 1980's, self-propelled artillery and antiaircraft weapons subunits that had attained the same mobility and armor protection as motorized-rifle companies in BMP's (with the goal of fire support of the latter's entry into an engagement), as a rule, were equally dispersed throughout the entire main force column. As a result, favorable conditions were created for a rapid advance, deployment and simultaneous entry into an engagement of all of the advance guard's various force organizations.

Naturally, **the combat missions of the subunits in a meeting engagement** were also repeatedly made more precise. During the first postwar years, when military theory was oriented on its emergence only during the course of a march, the advance guard's immediate objective was reduced to the defeat of the security or combat security and forward subunits of the enemy main force. The immediate objective of the forward detachment included defeating the subunits that were moving to contact it and to seize a certain line. In the process, the front of the offense and the depth of the security element's advance from the deployment line was not determined beforehand.

An attempt of mathematical calculation of the scale of a meeting engagement was undertaken for the first time only in the 1970's. It was determined that a motorized-rifle battalion's offensive front with the employment of only conventional weapons could reach 1,000 meters and, with the employment of nuclear weapons, 2,000 m, and motorized-rifle companies—400 and 800 m, respectively. The depth of the advance guard's immediate objective totaled: In the first case—eight km (the motorized-infantry or tank battalion march formation of the probable enemy), and in the second—in the entire depth of destruction of the enemy using nuclear strikes. In both variants, the company's immediate objective nearly coincided with the battalion's.

Later (in the 1980's), the battalion's immediate objective in a meeting engagement was determined while proceeding from in which capacity it was operating. So, the forward detachment should have seized the indicated point, inflict fire of all weapons against the enemy's advance subunits, and support the advance and deployment of the regiment's main force. And the advance guard: Destroy enemy security subunits, immobilize its main force using aggressive operations, and support the regiment's deployment and entry into the engagement. In the process, the immediate objective of a company that was operating in the advance party consisted of destroying enemy reconnaissance and security subunits, seizing a favorable position, and supporting the deployment of the battalion's main force.

As for the regiment's main force battalion, its mission consisted of destroying the forward subunits of the counteracting enemy on the axis of the offensive, destroying or seizing artillery, and seizing a position that ensures favorable conditions to continue the advance.

The expansion of the range of combat missions in a meeting engagement was entirely justified and permitted commanders and staffs in each specific case to determine them while considering the battalion's role and location in the unit's combat formation and the actual situation.

In the postwar years, the experience of numerous exercises caused the need to optimize the formation and content of the work of the battalion commander and staff while organizing a meeting engagement. The latter was conducted in two stages: During preparation for the march (any other troop movement), and also upon detection of an advancing enemy and when security subunits engaged the enemy.

While preparing a movement, the battalion commander clarified the mission and assessed the situation. Based on reconnaissance data, he determined the locations and time of a probable encounter with the enemy and planned the order of subunit operations. Calculations depended on the speed of movement of the mixed columns. They continuously increased in the period being examined. So, if at the end of the 1940's, motor vehicles, tanks, and towed artillery moved no faster than 20 kilometers per hour [kph], in the 1980's their speed increased to 25-30 kph. As a result, the closure of the meeting columns occurred nearly 1.5 times faster. So, the periods for organizing a meeting engagement were reduced to a minimum (10-15 minutes). Consequently, sound advance preparation for it for it was already required in the process of making the decision on the march. In the process, besides purely marching measures, they defined: The locations of a probable encounter with the enemy and subunit deployment procedures for an engagement; formation of the column and distribution of men and equipment in it; the composition, missions and distance of march security elements.

the procedures for repelling enemy air strikes and other issues that support the battalion's entry into an engagement in the shortest period of time without complex redispositions of forces.

Ultimately, its organization was completed after detection by reconnaissance of columns advancing directly toward it and, frequently, when the advance party engaged enemy forward subunits. While taking into account the distance of the ambush from the advance guard's main force column and the latter's opportunities for maneuver, that took up 15-20 minutes. During that time, the battalion commander should have assessed the situation, made the previously made decision more precise, determined the combat missions of subordinate subunits and advanced toward the advance party in order to lead the meeting engagement from there based on personal observations.

Right now, it is customary to think that the latter will begin with the engagement of the advance patrol that has been allocated from the advance party. During an encounter with overwhelming forces, it occupied a tactically favorable point on terrain and held it until the advance party arrived which, in turn, occupied a favorable position and supported the deployment and entry into the engagement of the battalion's main force. Thus, a meeting engagement began already at a distance of 10-15 km (versus the former 5-10) from the battalion main force column and 4-6 km from the advance party. This created favorable conditions for its operations and provided more time to the battalion commander for direct organization of a main force meeting engagement.

Let's turn to the evolution of views **on the attack of the advance guard's main force and on subsequent operations of the advance party in a meeting engagement.** At the end of the 1940's and in the 1950's, the advance guard's main force, in broken formations in motor vehicles or armored transport vehicles, advanced toward the planned deployment location, during the approach to which subunits were mixed and transport vehicles were driven to a secluded location (Figure 1).

Under the cover of artillery fire, companies rapidly advanced to the deployment location and, without being delayed here, rapidly attacked the enemy, encircling one or both flanks in order to prevent the enemy from maneuvering and to deprive him of the capability to assume the planned combat formation or to create a defense or regroup forces.

With the equipping of motorized-rifle troops with BTR-60PB's that are not only transportation but also an adequately effective fire weapon, along with operations in the engagement while dismounted, an attack of the enemy in armored transport vehicles is already envisioned. And with the introduction of BMP's into the troops, it was determined that a motorized-rifle battalion, as a rule, will attack the enemy in combat vehicles without disembarking personnel (Figure 2).

In this case, the forward detachment, under the cover of fire of the advance party and self-propelled artillery and while utilizing hidden approaches and sometimes also camouflage using aerosols, rapidly advanced in the direction of the strike. On the move, it deployed into combat formation and, as a rule, completed the destruction of the enemy security element with a headlong assault into the flank or rear. After that, the security element seized the area assigned to it and held it until its main force arrived. The advance guard boldly and decisively penetrated to the enemy main force, pinned it down using fire and initiative actions, and supported the regiment's deployment and entry into the engagement. Battalion subunits skirted or negotiated natural and man-made obstacles.

When an airborne assault (airborne-assault subunit) landed on the axis of its operations, the battalion commander was tasked to take all steps to link up with it as rapidly as possible and to carry out the assigned mission through joint operations.

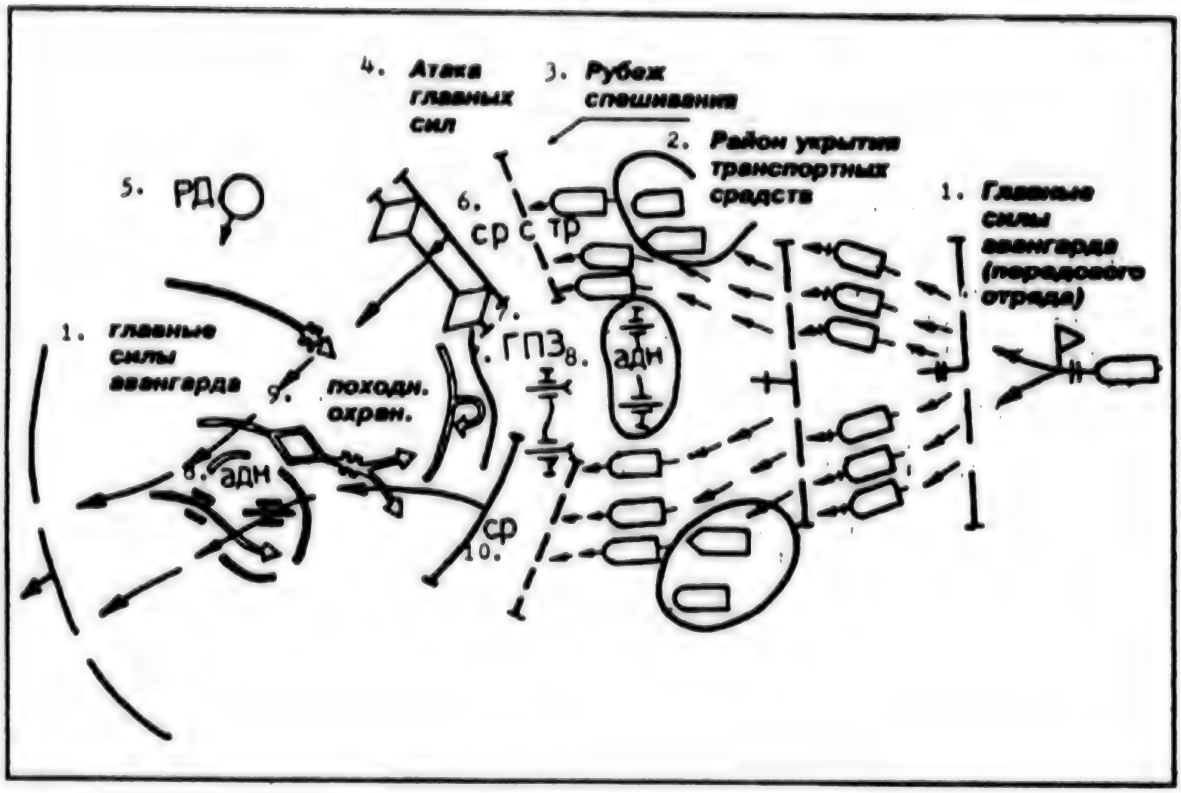
In the event that the enemy used superior forces to prevent the forward detachment from reaching its assigned area while the advance guard was deployed, the battalion had to pin down the opposing subunits on a broad front using the fire of all weapons and aggressive operations, inflict maximum destruction on the enemy and provide favorable conditions for deployment of the regiment's main force. In the process, motorized-rifle subunits dismounted, and tanks and armored infantry vehicles (armored transport vehicles) occupied fire positions behind cover and destroyed the enemy by fire.

Deployed in combat formation, the regiment's main force battalion moved, under cover and at maximum possible speed, to its axes, rapidly attacked the enemy and exploited the offensive into the depth without stopping. When the enemy attempted to shift to a favorable defense position, subunits, using fire and a decisive attack from the move, rushed to dismember its combat formations, destroy personnel and weapons, seize the area, and continue to carry out previously assigned missions.

Having detected an enemy withdrawal, the battalion immediately shifted to pursuit, destroyed the cover subunits, rapidly penetrated into its main force and, in coordination with other subunits that were conducting pursuit along parallel routes, completed their defeat. A battalion or company that was operating on the withdrawing flank, had to rapidly, using the shortest paths, emerge on the axis of the enemy withdrawal and decisively attack it in the flank. In the process, a new meeting engagement that developed even more rapidly was not excluded.

When the enemy was engaged, battalion technical support and rear services subunits rapidly deployed behind its combat formation (in an area that was inaccessible for tank operations) in readiness to support the companies with ammunition and fuel. The aid station and the

Figure 1



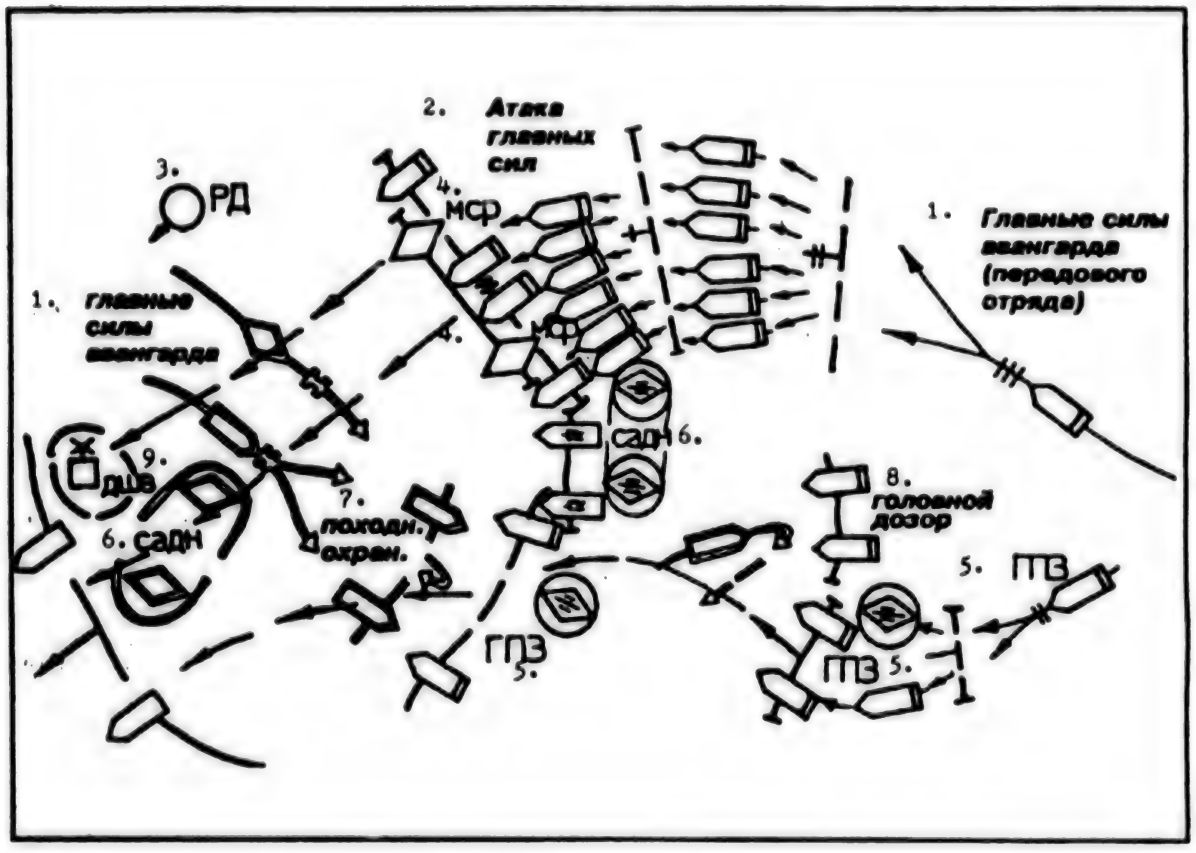
Key:
1. Advance guard (forward detachment) main force.
2. Transport vehicle shelter area.
3. Dismount line.
4. Main force attack.
5. Reconnaissance patrol.
6. Rifle company with tank company.
7. Advance party.
8. Artillery battalion.
9. Security elements.
10. Rifle company.

technical surveillance point moved directly behind the attacking subunits: The former—to render aid to the wounded and; the latter, to determine the location of vehicles that were mired down or had broken down.

Depending on the situation and nature of the terrain, motorized-rifle (tank) companies from the battalion's main force utilized two techniques to advance to attack the enemy. The more typical of the two was gradual deployment. The deployment area in company columns was designated at a distance of 2-3 km and, in platoon columns, up to 800 m from the final coordination line. But, unfortunately, this convenient variant for the troops did not support the element of offensive surprise. Therefore, if conditions permitted, companies traveled to the final coordination line in travel formation and assumed the combat formation with a simultaneous turn of all vehicles toward the offensive. In this case, deployment time was reduced by nearly a factor of two which helped to attain the element of offensive surprise.

Thus, improvement of meeting engagement tactics of rifle (motorized-rifle, tank) troop subunits proceeded along several directions in the postwar years. The combat capabilities of the advance guards and forward detachments were continuously increased, which promoted their self-sufficiency to resolve the missions assigned to them and permitted them to increase the break away of these march security elements from the regiment's main force, and ensured depth and effectiveness of reconnaissance of the enemy on the march. The shift of motorized infantry to armored transport vehicles and armored infantry vehicles and artillery, antitank weapons, and air defense weapons to a self-propelled

Figure 2



Key:
1. Advance guard (forward detachment) main force.
2. Main force attack.
3. Reconnaissance patrol.
4. Motorized-rifle company.
5. Advance party.
6. Self-propelled artillery battalion.
7. Security elements.
8. Point of the advance guard.
9. Decimetric wave.

armor base created all of the conditions for the simultaneous friendly attack of the enemy in the flank and in the rear without dismounting personnel and with the subsequent exploitation of the offensive into the depth and the transition to pursuit. A substantiated definition of combat missions within their capabilities for subunits, planning operations beforehand along several variants and their comprehensive support, facilitated success in a meeting engagement to a significant degree.

Tactical Effects of Nuclear Detonations

94UM0029B Moscow VOYENNYY VESTNIK in Russian No 6, Jun 93 (Signed to press 21 May 93) pp 38-41

[Article by Doctor of Military Sciences, Professor, Russian Federation Honored Figure of Science, Retired Major-General Yu. Dorofeyev: "With Both Number and Skill"]

[Text] Neutralization of a nuclear strike is an integral part of the restoration of the combat capability of subunits. It can be carried out either by surviving personnel, by specially designated formations that are combined into a composite detachment, or by a special organic subunit that is capable of performing that mission. Furthermore, neutralization of an engagement with nuclear fires depends on many factors and, first of all, on the yield and type of detonation, on local and meteorological conditions, the availability of roads in the stricken area and the density of the tree blowdowns that have been formed.

But what will the nature of enemy operations be after a retaliatory strike from our side? In what state will personnel who have found themselves in the nuclear impact zone turn out to be? Will they be capable of performing combat missions after profound psychological stress? All of this must be taken into account when you begin to organize work for the neutralization of a nuclear strike and for the restoration of the combat capability of personnel.

Since each subunit already has a combat mission in an engagement, the inclusion of any of them in the neutralization detachment will hardly be advisable both for combat considerations (weakening of troops that are conducting combat with the enemy) and also for moral-ethical considerations (some are fighting, others are waiting until the fighters suffer losses).

Proceeding from what has been said, two solutions can be proposed:

1) Any second echelon subunit receives the mission (besides its primary mission) at a certain time after a nuclear strike (of course, if it has not lost its combat capability) to advance to an area (stricken area) designated by the senior commander and to begin work. In so doing, you must keep in mind that the personnel of this subunit have been completely trained beforehand to carry out measures to neutralize a nuclear detonation.

2) Various types of subunits have been designated beforehand to be components of the composite detachment. They are involved with their assigned task in the troop combat formation but they are read to join the detachment. And in this case success will depend on their level of training for joint operations. After a nuclear strike, these subunits, based upon an established signal, advance to the designated assembly area, combine, clarify the neutralization mission and begin to carry it out.

Both of these approaches also have their shortcomings. Both the one and the other permit me to say with certainty that the appropriate command will arrive from the senior commander after a nuclear strike. And if the appropriate order has been issued, the subunits allocated will be able to arrive at the designated area under conditions of massive destruction and fires, with heavy pollution of the atmosphere, etc.

That is, an efficient situation assessment system and the equipping of subunits with gear that permits them to independently neutralize the causes that impede movement in the stricken area, are needed for the successful accomplishment of the missions. Another solution also arises: To create special subunits that are capable of conducting both combat operations and also neutralizing the stricken area.

We need to keep in mind that the dimensions of the stricken area will depend on the location of the subunit in the combat formation, and its characteristics as a target. Because a nuclear strike against some target (subunit) or other is inflicted with a munition of a certain yield, it is customary to consider the approximate calculated munition during a strike against a company to be 2,000 tonnes (in the recalculation to TNT) and during a strike against a battalion—10,000 tonnes. This does not exclude the possibility of the employment of several munitions of lesser yields in strikes. In any case, the size of the stricken area permits us to imagine the amount of rescue and restoration work during neutralization and also the composition of the composite detachments.

The data cited in Table 1 characterizes the stricken areas when the calculated munitions are detonated.

Table 1

Indicators that Characterize Stricken Areas (mean data)	Yield of the detonation	
	2,000 tonnes	10,000 tonnes
Radii of the casualty zones of personnel located, km:		
In the open	1	1.5
In trenches	0.65	1
In dugout shelters	0.3	0.45
In BMP's	0.4	0.65
Radii of the zones of medium destruction, km:		
Trenches	0.4	0.5
Dugout shelters	0.3	0.45
Radii of zones of medium destruction of BMP's, km:	0.2	0.35
Radii of zones of total destruction of the forest, km:		
Air burst	0.6	1
Ground burst	0.4	0.7
Radii of zones of widespread tree blowdowns in the forest, km:		
Air burst	0.65	1.1
Ground burst	0.45	0.8
Radii of zones of partial tree blowdowns in the forest, km:		
Air burst	0.8	1.5
Ground burst	0.65	1.1

Table 1 (Continued)

Indicators that Characterize Stricken Areas (mean data)	Yield of the detonation	
	2,000 tonnes	10,000 tonnes
Radii of zones of piles of debris in populated areas, km:		
Air burst	0.7	1.2
Ground burst	0.5	0.9
Radii of zones of fires, km:		
In the forest	0.8	1.6
In populated areas	1.3	2.5
Sizes of craters with a ground burst, m:		
Radius/depth	25/11	40/20
radius/height of the heap zone	50/3	80/5
Dimensions (length/width) of zones of radioactive contamination of the terrain (with a ground burst and average wind velocity of 25 kph), km:		
Zone A	18/3.5	43/5.7
Zone B	6.5/1.1	17/2.5
Zone C	3.5/0.7	9.9/1.5
Zone D	1.6/0.25	4.9/0.8

Comparing the stricken areas with the dimensions of typical targets, we can establish the dimensions of the consequences of nuclear detonations (Table 2). Let's take the following data calculated for six hours after occupying the defense. For a company: 100 men; 12 BMP's; occupied area—1.5 X 0.5 km; 0.9 km of trenches; 1 dugout shelter; with a 30% population density—0.25 km^2 of forest; with 20% development—0.2 km^2 of occupied populated areas through which up to 1.5 km of roads pass. Distribution of personnel: 30 men in BMP's, 50 men in trenches, 10 men in a dugout shelter, and 10 men in the open. For a battalion: 500 men; 50 BMP's; occupied area—5 X 2 km; 3 km of trenches; 6 dugout shelters; with a 30% population density—3 km^2 of forest; with 20% development—2 km^2 of occupied populated areas through which up to 15 km of roads pass. Distribution of personnel: 150 men in BMP's, 250 men in trenches, 50 men in dugout shelters, and 50 men in the open.

Table 2

Possible consequences of nuclear strikes	Company defensive position	Battalion defensive area
Air burst		
Losses of personnel, in men, located in:		
—the open	10	30
—in trenches	40	100
—in dugout trenches	15	20
—in BMP's	5	5
Total, including irrecoverable	70/20	155/50
Destruction of fortifications:		
—trenches, km	0.5	1
—dugout trenches, each	1	1
Number of damaged BMP's, each	3	15
Widespread tree blowdowns, km^2	0.1	0.5
Total destruction of the forest, km^2	0.15	2.5
Extent of debris on the roads:		
—in the forest, km	up to 0.5	up to 2
—in populated areas, km	up to 0.3	up to 1
Area engulfed in flames:		
—in the forest (only in tree blowdown areas), km^2	0.1	0.5
—in populated areas, km^2	up to 0.2	up to 2
Additionally with a ground burst: Extent of heaps of dirt with a height of up to 2 m on roads in the area of a crater, m	up to 50	up to 100
Area of radioactive contamination, including from the windward side, km^2		
—Zone A	0.01	0.2
—Zone B	0.01	0.2
—Zone C	0.01	0.3
—Zone D	0.01	0.8

The calculations have been conducted from the assumption that the personnel and weaponry of subunits, the forest and structures on the terrain are equally distributed in a stricken area. In that case, the following will be

exposed to radioactive contamination (and consequently, are subject to radiological decontamination and decontamination procedures) in a company: 200 m of trenches, two BMP's and 10 men and, accordingly, in a battalion—up to 100 m of trenches, eight BMP's and 50 men.

Proceeding from this, we can establish the types and amounts of work which must be completed in stricken areas and also the expenditures of men and equipment (Table 3).

Table 3

Number	Type of work (standards)	Expenditures of men and equipment	
		In a company	In a battalion
Ground burst			
1.	Reconnaissance of the nuclear stricken area (up to 5 man-hours per 1 km², man-hours	4	35
2.	Cleanup of debris on roads	(200-300 meters per hour—IMR [obstacle-clearing engineer vehicle] (BAT-2 [bulldozer]) or a combat engineer squad), vehicle-hours, man-hours	
—in the forest	2/14	5/35	
—in populated areas	0.3/2	1/7	
3.	Restoration of trenches (10 linear meters—10 man-hours), man-hours	500	1.000
4.	Cleanup of the entrance to a dugout shelter, man-hours	1.5	1.5
5.	Evacuation of the dead from trenches and BMP's, rendering first aid (2 man-hours per person rescued), man-hours	100	210
6.	Evacuation of vehicles (each—0.5 vehicle-hours/1 man-hour), vehicle-hours/man-hours	1.5/3	7.5/15
7.	Localization of fires (organization of idv [not found] fire strips—2 km per hour), vehicle-hours/man-hours	0.2/4	1.3/20
8.	Reinforcement of the elements of a dugout shelter (5 man-hours per 10 m of trench), man-hours	2	2
9.	Setting up revetments, man-hours	250	500
10.	Cleaning the road in the debris area (100 m—10 vehicle-hours/20 man-hours), vehicle-hours/man-hours	5/10	10/20
11.	Radiological decontamination by removing 3-4 cm of dirt (10 m—5 man-hours), man hours	100	500
12.	Special processing of vehicles (per vehicle—0.5 man-hours), man-hours	1	4
13.	Decontamination of personnel (per person—1 man-hour), man-hours	10	50
Total: for points 1-6, vehicle-hours/man-hours		3.8/624.5	13.5/1.303.5
For points 7-13, vehicle-hours/man-hours		5.2/377	11/1.096
Air burst, vehicle-hours/man-hours		4/880.5	14.5/1.825

In the stricken area, work on points 1-7 and 10 must be conducted by the neutralization detachment and by the special subunit (idv) immediately after the nuclear detonation; and for points 8-9 and 11-13—by personnel of subunits after the restoration of their combat readiness.

The composition of the detachment is determined in accordance with the calculated expenditures for the accomplishment of work for points 1-6 which should take no more than 10 hours to complete. But on average there should be one deceased person and from one to three people who are temporarily incapable of accomplishing combat missions per rescuer.

Therefore, the neutralization detachment must consist of a minimum of 60 men and special equipment for accomplishing missions at a company defensive position. And in a battalion defensive area—no less than 130 men who are equipped with everything necessary.

A battalion can allocate one neutralization detachment to accomplish missions in stricken areas (in companies). Its approximate composition: one-two motorized rifle platoons (25-50 men; 3-6 BMP's), a combat engineer squad (up to 10 men, and an obstacle-clearing engineer vehicle; a truck), an aid station (eight men, two ambulances), a repair-evacuation squad (five men, two special vehicles), an RKhB [radiation-chemical-biological] reconnaissance squad (three men, one special vehicle), that is, 50-75 men and 10-13 vehicles.

A regiment is capable of forming two neutralization detachments for work in stricken areas (in battalions), each consisting of: A motorized-rifle company (up to 100 men, 12 BMP's); a combat engineer platoon (22 men, five pieces of equipment, including an obstacle-clearing engineer vehicle); an aid station (eight men, two ambulances); a repair-evacuation squad (five men, two special vehicles); two RKhB [radiation-chemical-biological] reconnaissance squads (six men, two special vehicles); that is, up to 140-150 men and 23 vehicles.

Thus, restoration of the combat readiness of subunits will depend not only on timely actions but also on the number and skill of the subunits allocated to the neutralization detachments. Unflagging attention must be devoted to their training.

Literature utilized:

1. *Dorofeyev, Yu.P., Shamshurov, V.K.*, "Inzhenernyye meropriyatiya zashchity ot sovremennykh sredstv porazheniya". [Engineering Protection Measures From Modern Weapons]. Moscow: Voyenizdat, 1974.

2. "Zashchita ot oruzhiya massovogo porazheniya" [Protection From Weapons of Mass Destruction], edited by V.V. Myasnikov. Moscow: Voyenizdat, 1989.

3. *Tsvylev, M.V.*, et. al., "Inzhenerno-spasatelnyye raboty [Engineering-Rescue Work]. Moscow: Voyenizdat, 1975.

4. *Imangulov, R.G.*, "Meditsinskaya sluzhba i zashchita ot oruzhiya massovogo porazheniya v podrazdeleniyakh" [The Medical Service and Protection From Weapons of Mass Destruction in Subunits]. Moscow: Voyenizdat, 1988.

Battalion Defense in Urban Areas

94UM0030A Moscow VOYENNYY VESTNIK in Russian No 6, Jun 93 (Signed to press 21 May 93) pp 81-82

[Article by Candidate of Military Sciences, Colonel P. Gendal, under the rubric: "To Assist Those Entering the Academy": "Battalion Defense in a City"]

[Text] The organization and disposition of the defense of a motorized-rifle battalion includes force disposition, a system of defensive and fire positions, a fire plan, and a system of man-made barriers (see diagram).

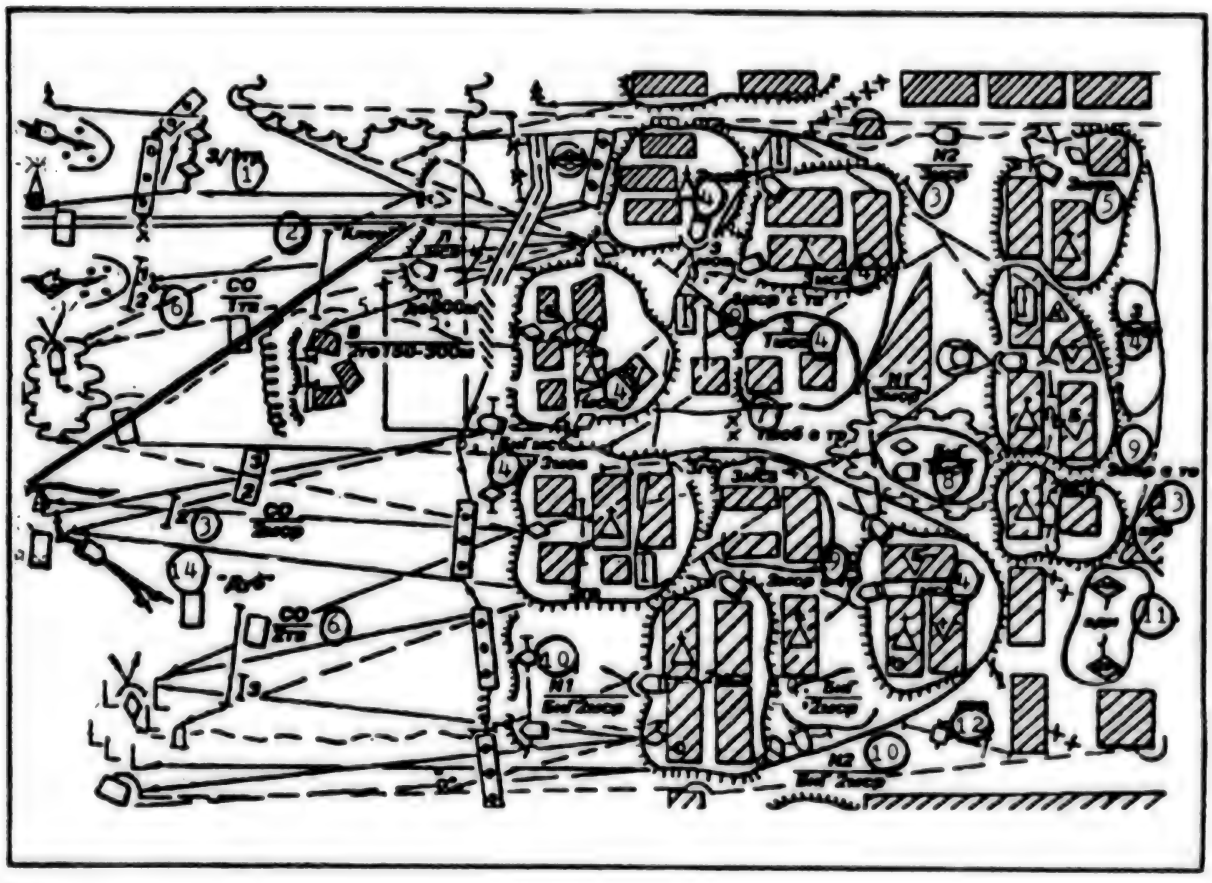
Force disposition depends on the importance of the target, the battalion's manning level, the composition of attached weapons, the dimensions of the defensive area, the anticipated enemy forces and axes of attack, and the layout of the city and the quality of the structures. Besides the usual elements, it includes a combined-arms reserve, (no less than a reinforced motorized-rifle platoon). An armor element, fire ambushes, and an assault team can also be created.

The armor element is designed to increase the aggressiveness of the defense, to close breeches that have been formed as a result of enemy fire strikes, and to destroy enemy subunits that have broken through into the depth. As a rule, it consists of several tanks and BMP's [armored personnel vehicles] (without an assault force) that have been allocated from first and second echelon companies. One of the platoon commanders is appointed armor element commander.

Fire ambushes are organized to destroy the enemy using surprise close range concentrated fire and direct laying. A typical composition of each is a tank, a BMP, and a team of soldiers or a squad that have been reinforced with flamethrowers.

It is advisable to create the assault team using second echelon forces to seize a building, important target on the leading edge or in the depth of the defensive area which the enemy has managed to penetrate. It is reinforced with tank and mortar platoons, a combat engineer subunit, and a flamethrower squad.

The mortar battery (an artillery battery that is attached to the battalion), and antitank and antiaircraft subunits usually remain directly subordinate to the battalion commander. But the grenade launcher and mortar platoons can be attached to motorized-rifle companies.



Key:
1. Tank company.
2. "Maple".
3. Motorized-rifle company.
4. Motorized-rifle platoon.
5. Up to 800 meters.
6. Tank platoon.
7. Motorized-rifle battalion with tank company.
8. Motorized-rifle battalion with armor element.
9. Motorized-rifle company with tank platoon.
10. Motorized-rifle company with armor element.
11. Artillery battalion.
12. Antitank platoon.
13. Battery computing section.
14. "Oak".

The system of defensive positions and fire positions includes: The combat outpost line; the defensive positions of the platoons and companies that have been united in the battalion defensive area (one or several sections); the fire positions of tanks and other organic and attached weapons; and, the trenches and connecting trenches. Furthermore, decoy defensive positions and reserve positions of subunits for guarding and defense of entrances (exits) to underground structures and lines o communication are also created.

A company can occupy several buildings. They are adapted for perimeter defense that ensures they will be held for a prolonged period of time even when completely encircled by the enemy.

Company defensive positions need to be created in such a way that they intersect or cover with their fire major streets, boulevards, squares and bridges across rivers and canals. The forward edge of the defense is usually set up along the outskirts of the city or is moved ahead.

Tunnels, the subway, sewer pipes and other underground structures and utilities are utilized for the maneuver of men and equipment in the battalion defensive area. Its flanks and passageways are set up within the sections.

Fire positions for direct laying weapons, tanks, and BMP's are selected in semi-basement rooms, behind stone walls, and on second floors with the calculation that they will be able to conduct fire along the streets and boulevards, squares, and other open areas. And for artillery batteries—on abandoned lots, in public gardens, squares and stadiums that support the conduct of fire, both in the primary and in the supplemental firing sectors and also direct laying.

PVO [air defense] weapons are located on the roofs of buildings and on the balconies of upper floors from where they can conduct 360° surveillance and destroy airborne enemy targets.

Trenches, lines of communications and separate trenches are dug in undeveloped sections, along rivers and canals, in public gardens and parks to conduct flanking and cross fire.

The fire plan is based upon a combination of flanking and cross fire of all types of weapons and is built in several layers to create multi-layered fire both on the accesses to the defensive area and also on the flanks and in the rear area of the subunits. It must ensure: Destruction of the enemy on the remote approaches to the battalion defense; repulsing massive tank and infantry attacks in front of the leading edge; covering fire of the flanks and intermediate points not occupied by subunits, and also man-made and natural obstacles; inflicting destruction on the enemy that has driven a wedge into the defense; and, rapid concentration of fire on any threatened axis or sector.

The system of man-made obstacles includes minefields, groups of mines, integrated obstacle complexes, ruins, other antitank and anti-infantry obstacles, facilities, and buildings that have been prepared for destruction. They create it in accordance with the concept of operations, in combination with the fire plan, while considering natural obstacles and the maneuver of our own subunits.

Demolition charges and mines are laid on the main highways on the accesses to the defense and to defended targets. Barricades and other barriers are set up on streets and in squares. They prepare bridges, overpasses, individual buildings and sectors of underground structures for demolition. It is practically impossible to create area mine fields in a city due to the complexity of their installation and camouflage. Therefore, various booby traps, remote-controlled mines, and directional-effect mines find widespread employment.

FOREIGN MILITARY AFFAIRS

Future Development of Anti-Aircraft Artillery

94UM0031A Moscow VOYENNYY VESTNIK in Russian No 6, Jun 93 (Signed to press 21 May 93) pp 75-79

[Article by Lt-Col A. Manachinskiy: "Antiaircraft Artillery: Status and Prospects of Development"]

[Text] At the end of the 1950's, antiaircraft missile systems had a monopoly among air-defense weapons. It became fashionable to speak in general of a crisis of antiaircraft artillery (AAA) and even its extinction.

However, the pessimistic prognoses of experts did not come true. Research studies, and especially the local wars of the 60's and 70's, demonstrated that 20 to 40 mm antiaircraft artillery was more suited than missile systems to engage planes, drones and helicopters operating at low and very low altitudes. In addition, antiaircraft cannon and mounts remained simple to operate, something which is of no little importance in a combat situation. And indeed, it was relatively easy for personnel to master them. Gradually, other unarguable advantages of antiaircraft artillery were also found. For instance, their very high survivability under enemy fire, better operating reliability, and resistance to jamming.

All of this could not help but raise the intensity of the scientific research and experimental design work (NIOKR) being conducted in the West which was in one way or another associated with antiaircraft artillery. The result was the concept of joint use of air defense missile systems and low-caliber antiaircraft artillery for the organization of tactical air defense on the battlefield.

According to this, at long range and at high or medium altitudes the primary role in destroying air targets is assigned to the air defense missile system. But within the near borders of the kill zones (1,000 to 3,000 m), preference is given to antiaircraft artillery, which engages basically low-altitude aerodynamic targets and helicopters. With time the antiaircraft artillery system (ZAK) appeared in the armies of developed countries, jointing together the weapons which allow independent implementation of the whole cycle of combat function, from detection to destruction of aircraft.

All the electronic systems of the antiaircraft artillery system are usually equipped with testing apparatus which operates practically continuously, although it is also possible to conduct special diagnostic tests with computers. According to the foreign press, this makes it possible to detect up to 95 percent of possible defects.

The extent and complexity of the missions performed by the components of antiaircraft artillery systems force the specialists to coordinate the research, development, testing and engineering work associated with their improvement within the framework of narrower areas of activity.

Detection of Air Targets

In this area, one should first of all mention improvement of the reconnaissance and target-tracking equipment which is part of the antiaircraft artillery systems, and also the development of automated external target designation equipment.

Reliance on radar stations continues to be the predominant trend in improving the equipment proper. Here, basic attention traditionally has been paid to enhancing jamming resistance. For protection against the influence of concealment and deception jamming, and especially barrage jamming, systems are used which maintain a constant false-alarm level with fixed and adaptive thresholds, and all sorts of devices for automatic gain adjustment of signals. Up to date methods for improving the characteristics of detection by increasing the signal-to-noise ratio are being implemented. For example, these may include coherent compensation of jamming in the side lobes of the antenna directional pattern (DNA) of the radar station, polarization selection of signals, and formation of adaptive antenna directional patterns.

The traditional moving target selection (SDTs) system, which makes it possible to observe signals against the background of passive jamming, has not exhausted its possibilities either, although it too has undergone significant adjustments. First of all, comb filters have been replaced or augmented with narrow-band doppler filters, implemented using discrete or fast Fourier transforms. Second, narrow-band filters are used which discriminate signals with zero doppler frequency (for the formation of a jamming map). This provides information about the average level of the radar signals in each resolving element. Third, a coherent sequence of probing pulses is used, with a complex form of intra-pulse modulation, making it possible to increase both the operating range and the jamming resistance of the radar. And fourth, signal processing methods are being improved through the introduction of microprocessors.

The development of two-channel radars is the latest thing in resolving the problem of jamming resistance of radar stations. One channel of such a station functions in the centimeter band, and the other in the millimeter band. Selection of either of them is automatic, depending on the values of the signal-to-noise ratio. When the values are equal, preference is given to the channel with the higher frequency. This also assures high accuracy and resolution of the station in angular coordinates, with minimal influence from radio signals which are repeatedly reflected from underlying surfaces.

Foreign military specialists believe that millimeter band radars will generally become widespread in future antiaircraft artillery systems, given their high degree of protection from EW [electronic warfare] assets and antiradar missiles (PRR), and their quite acceptable range of operation in dust, rain and fog. In principle, such radars are capable of competing with infrared imaging and television, laser and optical means of detection and tracking of low-flying targets.

Laser locating stations, which indisputably enjoy a number of advantages over radar, are being developed. Advantages include better jamming resistance and higher resolution, making it possible to reproduce target contours, and consequently to establish nationality from outward appearance. What is more, such radars offer the possibility of more accurately measuring the speed of the targets over a very wide range, and have less complicated design.

Infrared systems are not very susceptible to the influence of jamming, and are capable of detecting air targets at any time of day, practically without revealing themselves. While their mass and size are insignificant, they have a comparatively high resolution in angular coordinates, especially when operating against low-flying targets. However, the dependence of such systems on weather conditions limits their use in rain and heavy clouds.

In the opinion of Western experts, it will be possible to radically compensate for inherent defects in the systems considered when they are combined into a single antiaircraft artillery system. Thus, it is possible to improve the protection of a radar station against jamming and antiradar missiles by augmenting it with an infrared detection system and laser range-finder. The operating wavelength of the range-finder is 10.6 micrometers, so it can be used as the source of target illumination for IR equipment operating in a range of 8-12 micrometers. This will bring an increase in the range of detection of the object of location (due to the increased temperature contrast), and a higher probability of its correct identification.

It is asserted that the combination of search systems may be quite effectively augmented with a television channel. Its main element is a television camera capable of functioning at low light levels. Usually it has a variable field of view: A wide search field of 7 to 8 degrees, and a narrow field (to 2 degrees) operating in the identification and tracking mode. The optics of the television camera and the line of sight of the target in this case are common to the TV channel and the laser range-finder. This achieves some reduction in the volume of the apparatus, and its cost.

A helmet-mounted device being introduced abroad for detection and target-designation is arousing undoubted interest. It includes: The helmet with infinitely focused optical sight, a magnetometer and two accelerometers; a control unit with communications apparatus strapped to the waist of the operator; and a mini-computer (the container for it is at the specialist's feet). All elements of the device are connected by cables to one another and to the antiaircraft cannon.

During combat operations, the azimuth and elevation of the target are determined by a set of sensors oriented

toward magnetic north and local vertical. This information is processed by the computer, which converts it into angles of elevation of the guns, and then transmits them in the form of control instructions to their tracking systems.

Developers of antiaircraft artillery system abroad are trying to resolve one of the most difficult problems of air defense, protection of troops from strikes by low-flying targets, by creating automated external target designation systems. This gives an immediate gain in time for the crews to prepare for fire, something which is especially important if their regular radars malfunction.

The U.S. Army, for example, has developed an automated forward radar warning system to warn of an air adversary. All of its basic elements (target detection station, IFF [identification friend-or-foe] apparatus, communications equipment and power source) are mounted on a wheeled all-terrain vehicle.

The operating principle is as follows. The radar searches for low-flying planes and helicopters in the division zone. The detected air targets are identified, and data about them is encoded and automatically transmitted to the portable receiver/display devices with which the crews of the antiaircraft weapons are equipped. The color of the signal indicates the nationality of the target: Green means "friendly plane," red the "adversary." And its situation on the screen indicates its location relative to the position. The displays are equipped with audio signals to attract the operator's attention.

Techniques in which whole groups of antiaircraft artillery systems are supplied with information about the air adversary from a separate detection radar, or from a radar station forward of the antiaircraft artillery system, are viewed as quite acceptable by foreign specialists. This is especially relevant for systems consisting of all-weather and clear-weather components.

The Western press has reported that there is even a variant under development in which six systems are combined into one, so that their radars can operate in the "slave-master" mode, handing off a target from one to the other and thus raising the survivability of the autonomous radar stations under enemy fire. In this kind of link, the master radar may receive additional information over the communications channel regarding all targets in its zone of responsibility, as well as data about the en route corridors of friendly aviation.

Fire Control

The combat effectiveness of the antiaircraft artillery system directly depends on the accuracy of fire delivery, which in turn is determined by the level of development of the fire control system (SUO). The following research trends for their improvement may perhaps be seen.

First of all, there is continued research in the field of radar fire control systems. Foreign specialists believe that at the present stage of technological development, it is quite impossible to create a antiaircraft artillery system without a radar. More and more, in today's radar fire control systems developers are using the high frequency bands (for example the millimeter band) introducing solid-state receiving and transmitting assemblies and jamming-protection systems, and switching to digital signal processing, without forgetting analog processing. It is thought abroad that the time has come to use programmable signal processors. Their attraction is their universality and the capability of altering their characteristics.

Second, the process of detection and tracking of air targets is being automated by including threshold devices in the apparatus, in particular with adaptive threshold variation, non-coherent pulse accumulators and false-alarm stabilization units.

Third, they are beginning to introduce apparatus to identify air targets based on time, spectral, and spatial information contained in the radar signals. Consequently, it is becoming possible to identify models.

Fourth, onboard computers are being developed on the basis of super-fast processors. With their appearance, it has become possible to quickly and accurately prepare information on the degree of hazard posed by targets, to determine the parameters of their motion, and to calculate (with allowance for different hypotheses of maneuver) the lead for opening and delivering fire.

Fifth, considering the vulnerability of radar stations to organized electronic countermeasures, they are backed up with infrared, television, laser and optical equipment.

Since they have not abandoned clear-weather antiaircraft artillery systems (relatively cheap) abroad, fire control systems for them are also being improved. Such systems most often consist of an optical sight with variable magnification and a rudimentary computer, making it possible to deliver fire with quite acceptable accuracy not only against air targets, but also against ground targets under good weather conditions. The systems can also be equipped with television units, laser range-finders, and IFF apparatus.

Improvements in Guns and Ammunition

The basic reason why antiaircraft artillery is classed as close-in weaponry is the relatively modest range of the ammunition, even though the instrument portion of the antiaircraft artillery system is capable of providing a larger kill zone for the system. That is why the possibilities of switching to high cannon calibers (up to 76 mm) and fundamentally raising the initial velocity of the rounds (to 5 or 6 km/sec) are being looked for so persistently. It is expected that the latter can be achieved by accelerating them with an electromagnetic field in the bore of the gun, for example, or by using liquid propellants.

It would appear that nothing could be simpler than extending the range of effective engagement of targets by

raising the caliber of the shell. But it turns out that this causes many problems. In particular, the weight of the gun increases, complicating the reloading process. Thus, there is a sharp drop in rate of fire, which in turn prevents attainment of high fire density.

In the search for compromise solutions, Western specialists have widely experimented with 20 to 40 mm guns. As a result of improvement of the operating algorithms and automatization of the fire control processes, it has been possible to improve the reaction time of such antiaircraft artillery systems to 6 to 8 seconds. The high density of the shrapnel field and the necessary duration of fire on the target have been achieved by increasing the rate of fire of the antiaircraft cannon. Multi-barrel mounts are being designed for this purpose. For example, in Spain they have even developed a twelve-barrel 20 mm mount.

In order to reduce the expenditure of ammunition without lowering the kill probability against an air target, shells have been developed that can be guided in the terminal phase of their flight trajectory. Those which use a laser, radar or infrared control apparatus evidently will become the most wide-spread. Such munitions are becoming virtual guided missiles in terms of design.

In the opinion of foreign specialists, even now the dimensions of such apparatus allow them to be carried in 57 mm shells or larger. Indisputably, the cost of the munitions will grow, but their effectiveness will increase many times over (by a factor of three to six). A shell can be used with identical success both against planes and against helicopters, including ones that are hovering.

The foreign press has reported tests of 76 mm high-explosive fragmentation munitions which can be adjusted in the terminal phase of their trajectory. A change in direction of its velocity vector within 10 degrees is implemented by six small pyrotechnic motors arranged evenly along the radial plane of the body, about the center of mass. It is expected that the six-kilogram shell will have contact and non-contact fuses, and the effective range of fire of guns with such shells will reach 10 km.

Nor have conventional munitions of antiaircraft artillery been forgotten. Here, equipping them with prefragmented shells is considered one of the promising research trends: Most often notches are made on the inside, thanks to which fragments of specific size and weight (0.2 to 0.3 grams) are formed in the explosion. Finished lethal elements are also being used. For instance, in Sweden spherical killing elements of tungsten carbide are compressed into the body of a 40 mm fragmentation shell for the Bofors L70 antiaircraft cannon.

The use of non-contact fuses is also provoking interest. In the opinion of foreign experts, these raise the effectiveness of antiaircraft mounts by a factor of 4 to 10 for fire on planes, and by a factor of 50 to 100 against missiles. There is information that they have developed a non-contact fuse abroad for 35 mm shells which is capable of calculating the conditions of impact with an obstacle. When there is a high probability of a direct hit of the shell on the target, it switches to the non-contact action, allowing it to be independent of jamming, including in flight at very low altitude.

There is great interest in 20 to 25 mm ammunition made from a brittle tungsten alloy, without fuse or explosive, reminiscent of sub-caliber shells in outward appearance. They have a high initial velocity which hardly changes in flight. For example, they cover a distance of four kilometers in four seconds. When striking the [aircraft] skin the core is destroyed, forming fragments which in turn break down into smaller ones when they pass through new obstacles. A sort of avalanche process develops.

Integration With Other Systems of Air Defense Weapons

Combined air defense missile and artillery systems (ZRAK) are arousing great interest. As a rule, they have common detection and tracking equipment, digital computers, and display and control systems. They are mounted on an all-terrain tracked or wheeled chassis.

Experience accumulated in the West gives grounds to say that in the development of combined air defense missile and artillery systems, preference is being given to air defense guided missiles with passive infrared homing. This is not surprising: After launch of the missile, the crew can immediately begin firing their cannon at another target, most often in the near zone.

But if the system has air defense missiles with a command guidance system (or controlled by a laser beam), in that case plans are to use the cannon chiefly for self-defense: as in the air defense missile-artillery system HVSD/ADAMS (High-Value Site Defense/Air Defense and Anti-Missile System), which the Israeli company Raphael developed jointly with the America's General Dynamics Company. It includes a Vulcan-Phalanx gun system and vertical-launch missiles from the "Barak" air defense missile system. Evaluation tests showed consistent kills of air targets at ranges up to 12 km.

Air defense missile systems (mainly portable ones) are also being integrated with towed antiaircraft cannon. Thus, the western media reported tests of a 40 mm antiaircraft cannon with Stinger air defense guided missiles mounted on it. As was noted, this variant was attractive primarily for economic reasons.

Linked but separately disposed antiaircraft artillery systems and missile systems have also appeared, for example the Skyguard-Sparrow in Italy, and the Sinai-23 in Egypt. The latter uses a ZU-23 twin antiaircraft mount and a modified variant of the portable Strela-2M air defense missile system.

Thus, after even a brief examination of the developmental tendencies of tube systems, one can say that antiaircraft artillery continues to be considered by the

West as a relatively reliable, flexible and economical weapon, which will have a long life in the system of tactical antiaircraft defense weapons.

Fiber-Optic Transmission Systems

94UM0033A Moscow VOYENNYY VESTNIK in Russian No 6, Jun 93 (signed to press 21 May 93) pp 88-91

[Article by Colonel M. Voznyuk, candidate of technical sciences, docent and Colonel Yu. I. Yaremenko, candidate of technical sciences, docent, Military Signal Academy]

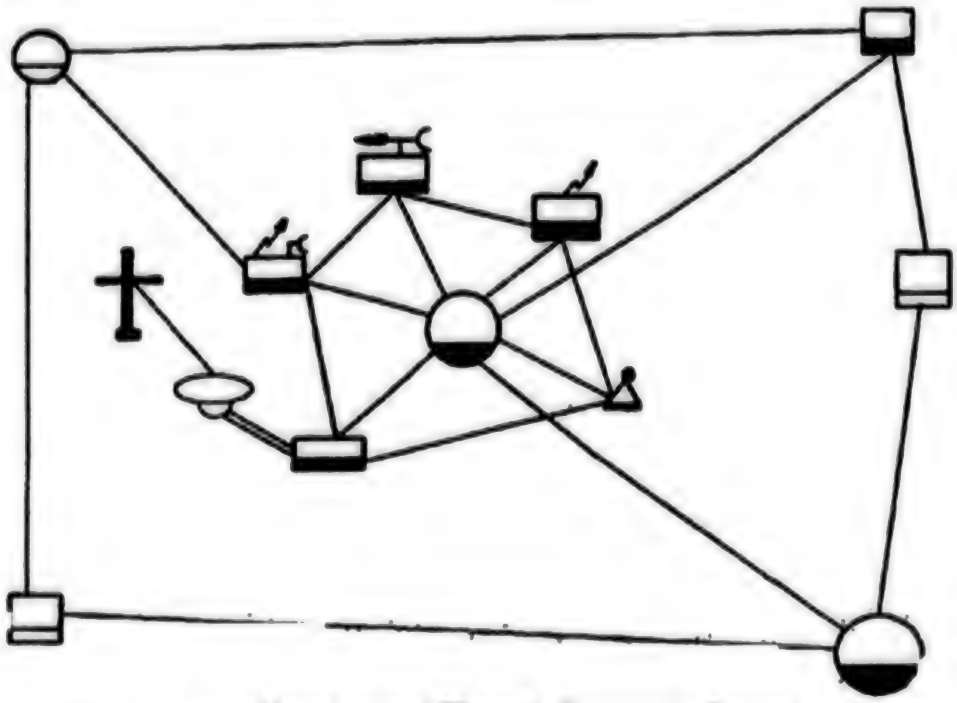
[Text] Armies of developed states have been introducing fiber-optic transmission systems more and more widely of late in order to improve the effectiveness of command and control of troops and weapons. Such systems possess high capacity, stability and protection against intelligence collection efforts, are insensitive to external electromagnetic radiation, and also practically exclude interception and the introduction of false information without disrupting the optical cable's integrity.

Fiber-optic transmission systems find use on fixed and field main signals lines, on lines within communications centers, on trunk lines (including with remote emitter modules), on coupler lines and on inserts providing galvanic isolation of communications centers to protect against electromagnetic radiation (see figure).

The first articles about their use in military affairs appeared in the foreign press in the latter half of the 1970's. For example, American M. Barnoski published an article in which he cited results of developing the AN/GAC-1 field long-range optical communications line for the U.S. Army for the joint Armed Forces main communications system (tactical communications network of the three services). The article mentioned replacing CX-11230 coaxial cables and CX-4566 multiquad cables with fiber-optic cables.

An Electronic Communications Command report (1985) cited the following data: 2 km of fiber-optic cable with drum weigh 93.5 kg, i.e., almost four times less than heavy field cable. It also was asserted that using fiber-optic transmission systems leads to increased mobility because instead of four 2.5 ton trucks, only one is required to transport cable. Consequently, the deployment rate also will increase inasmuch as, for example, a 64-km line will contain only 7 instead of 39 unattended regenerators, and lines up to 8 km in length are constructed without installing regenerators at all. Subsequent writings of foreign military specialists additionally noted the increased survivability and reliability of fiber-optic lines because of their essentially absolute insensitivity to the effect of electromagnetic radiation and other electromagnetic interference.

According to foreign military specialists, fiber-optic transmission systems are applicable both on fixed and field lines as well as on lines within communications centers, on trunk lines, and also within various installations. Using them to communicate with emitter modules



Areas of Introduction of Fiber-optic Transmission Systems.

remoted outside a command and control facility also produces good results. A U.S. Air Force project probably was the largest; within its scope a network is being created for servicing the MX ICBM system in the states of Nevada and Utah with an overall length of 15,000 km and joining 5,000 communications centers and command and control facilities.

An appreciable increase in the number of articles on new possibilities for employing fiber-optic transmission systems both for peaceful as well as military purposes has been noted abroad in recent years. Here are some examples:

As of today, over 11,000 miles of optical cable have been laid on U.S. territory. This is economically profitable, since the cost of fiber-optic transmission systems per unit of a frequency band is 10 times lower than in equivalent electrical systems.

A program has been developed for creating a fiber-optic trunk line (FOTS-LH) around 10,000 km long, which will replace metallic cables. It is to be constructed in South Korea from Seoul to Pusan.

There are projects for using fiber-optic inserts in AN/TRC-170 tropospheric communications links operating in the TRI-TAC system. Articles also tell about successful operation of a 147-km fiber-optic transmission system in a multimode cable placed in operation at a missile test center in California and being used for controlling MX ICBM's.

The U.S. Army Signal Corps began implementing developed programs for introducing fiber-optic cables at the tactical command and control level (TAFOCA and SIMFOCS systems). For example, it provides for laying optical cable from a helicopter at a rate of up to 145 km/hr across difficult or contaminated terrain sectors.

Development of a base system for transmitting video data for the Army tactical command and control level also is of interest. It is intended for providing video, facsimile and audio conference communications using a distributed switching network between elements of command and control facilities separated from each other.

Tests of two varieties of this system—fixed and field for the Armed Forces command—also were successful. The latter was employed during NATO exercises Crested Eagle-84 and WINTEX-85. Its deployment to half-capacity (32 elements) took 12 hours and to full capacity less than 24 hours.

The plan for prospective development of military programs notes that CX-11230 cable in the TRI-TAC system is to be fully replaced by fiber-optic cable before 1995.

Around 20 scientific research teams in the U.S. Defense Department are engaged in developments in the area of optical communications. Appropriate funds also are being allocated. Thus, last year the Army and Navy spent over $600 million and the Air Force $1.5 billion for these purposes.

Western European countries also have development projects for military fiber-optic transmission systems. For example, France began replacing single-quad cable for fiber-optic cable in the RITA tactical communications system.

The ZAT-4 fiber-optic transmission system, an advanced version of the ZAT-19.2-1 secure communications system now in operation, is being introduced in Sweden to increase security of data transmission between computers and terminals or control units. It uses a modulation method essentially precluding the possibility of tapping the line and removing information (or introducing false information). The optical signal has a significant constant component and small amplitude modulation depth, which permits easy detection of any unsanctioned removal of signal power from the line (registered by the receiver).

The ZAT-4 provides duplex communications to a range of up to 2 km with a transmission rate of 2.4576 megabauds over a twin-fiber optical cable of 50/125 microns. A light-emitting diode is used as the emitter and a p-i-n photodiode as the receiver.

The Italian firm of Telettra produces a wide range of fiber-optic transmission systems both for civilian as well as military use. Single-mode and multimode optical fibers are being used in cables. Characteristics of some of those systems are shown in Table 1.

Table 1

System	Length of Regeneration Path (lp), km	Type of Optical Fiber	Wavelength (λ), microns	Emission Source	Transmission Rate, megabits/sec
DTF-2LT	25	SM	1.3	Laser	
DTF-34LT/OR	12	MM	0.85	Laser	34
	24 (10)	MM	1.3	Laser (LED)	34
	50 (10)	SM	1.3	Laser (LED)	34
DTF-140LTA/IR	45	SM	1.3	Laser with FB	140
	12	MM	1.3	LED	140
DTF-565LT/IR	35	SM	1.3	Laser with FB	565
	70	SM	1.55	Laser with DFB	565

Table 1 (Continued)

System	Length of Regeneration Path (lp), km	Type of Optical Fiber	Wavelength (λ), microns	Emission Source	Transmission Rate, megabits/sec
WDM 2x565	30	SM	1.3	Laser with FB and DFB	1200
	30	SM	1.55		1200
565NG	35	SM	1.3	Laser with FB	565
	70	SM	1.55	Laser with DFB	565
Planned	30	SM	1.55	Laser with DFB	2400

Note. LED—light-emitting diode; SM—single-mode; MM—multimode; FB—feedback; DFB—distributed feedback.

And so, initial fears that wide introduction of fiber-optic transmission systems hardly will be possible inasmuch as parameters of optical components deteriorate under the effect of ionizing radiation proved to be exaggerated. Research has shown that progress in their production technology and steps taken to improve radiation resistance permit obtaining characteristics of optical transmission systems fully acceptable for practical use.

It is apropos to say here that the U.S. Defense Department has a program (VHSTC) envisaging development of integrated circuits with a level of integration and speed an order of magnitude higher than the existing generation. Over the next few years this element base is planned to be used in all new military communications and automated command and control systems. Consequently, they will operate more reliably and stably and with increased capacity and promptness, i.e., more effectively, than now. Also of no small importance is that introduction of fiber-optic transmission systems finally will permit remoting communications centers to necessary distances outside of command and control facilities.

In conclusion, we will note that introduction of our own fiber-optic systems is inferior to foreign practice in many indicators. Nevertheless, our existing technological base and operating models of fiber-optic transmission system gear for various purposes permit using optical transmission systems to increase command and control efficiency.

Thus, we are putting out series gear for local (Sonata-2 and Sopka-G), intra-area (Sopka-2 and Sopka-3) and main (Sopka-4 and Sopka-5) fiber-optic transmission systems. Their principal data are shown in Table 2.

Table 2

Fiber-Optic Transmission System Gear	Type of Optical Fiber	Cable Attenuation, db/km	Wavelength, microns	Transmission Rate, megabits/sec	Line Length, km	Regeneration Path Length, km	Number of Channels
Sonata-2	MM	3(5)	0.85	8.448	100	14(8)	120
Sopka-2	MMG	1	1.3	8.448	600	30	120
Sopka-3	MMG	1	1.3	34.368	600	30	480
Sopka-3M	SM	0.3	1.55	34.368	600	70	480
Sopka-4	SM	0.7	1.3	139.264	2500	30	1920
Sopka-4M	SM	0.3	1.55	139.264	2500	70	1920
Sopka-5	SM	0.3	1.55	564.992	2500	70	7680

Note. MM—multimode fiber; SM—single-mode fiber; MMG—multimode graded fiber.

High-quality, single-mode optical cables with excellent characteristics also are being produced. For example, attenuation of the OMZKG-10 cable is only 0.7 db/km at a wavelength of 1.3 microns, and even less for Kalibr-4M—0.3 db/km at a wavelength of 1.55 microns. There also is gear supporting different areas of application of fiber-optic lines.

In our opinion, increased effectiveness of communications systems and automation of command and control of troops and weapons can be achieved by a sensible combination of fixed and mobile components not only of fiber-optic transmission systems, but also of open optical transmission systems on condition of a solution to problems of selection and introduction of their optimum types and electronic equipment, and problems of the structure and coordinates of corresponding elements of command and control facilities.

Bibliography

1. Barnoski, M. K., "Fiber-Optic Systems for Military Use," TIIER, Vol 6, No 10, 1980.

2. Vinogradova, N. N. and Krupina, V. L., "Analysis of the Status and Development Trends of Fiber-Optic Data Transmission Systems," ZARUBEZHNAYA RADIOELEKTRONIKA, No 8, 1982.

3. Lynch, J. F., "Trends in Fiber Optics," SIGNAL, Vol 39, No 10, 1985.

4. "ZAT-4 Secure Fiber-Optic Transmission System," INOSTRANNAYA TEKHNIKA I EKONOMIKA SREDSTV SVYAZI, No 4 (108), 1988.

5. Avdoshin, Ye. S., "Fiber-Optics in U.S. Military Equipment," ZARUBEZHNAYA RADIOELEKTRONIKA, No 11, 1989.

6. "Telettra Fiber-Optic Transmission Systems," INOSTRANNAYA TEKHNIKA I EKONOMIKA SREDSTV SVYAZI, No 5 (135), 1989.

7. "Tekhnika elektrosvyazi za rubezhom. Spravochnik" [Electric Communications Equipment Abroad: Reference], Moscow, Radio i svyaz, 1990.

8. "Tactical Fiber-Optic Communications Line," INOSTRANNAYA TEKHNIKA I EKONOMIKA SREDSTV SVYAZI. EKSPRESS-INFORMATSIYA TSOONTI EKOS, No 5 (161), 1990.

9. Vizel, A. A. and Voronenko, V. P., "Fiber-Optic Communications Systems," ITOGI NAUKI I TEKHNIKI VINITI, Vol 6, "Fiber-Optic Communications Systems," VINITI, 1990.

10. Guskov, N. A., "Fiber Optics in a Radiation Environment," ZARUBEZHNAYA RADIOELEKTRONIKA, No 8, 1991.

11. Rudov, Yu. K., "Fundamental Directions in Work of Dalnyaya svyaz' NPO," ELEKTROSVYAZ, No 12, 1991.

12. Yermolov, A. G., et al, "Problems of and Prospects for Introducing Fiber-Optic Transmission Systems in the Unified Automated Communications Network," ELEKTROSVYAZ, No 7, 1991.

13. Polishuk, P., "Review of Fiber Optics Developments in the United States," PROCEEDINGS OF THE INTERNATIONAL SOVIET FIBER OPTICS CONFERENCE, Vol 1, 1991.

14. Yaremenko, Yu. I., "Teoreticheskiye osnovy postroyeniya i primeneniya sredstv svyazi opticheskogo diapazona" [Theoretical Principles of Building and Using Optical-Band Communications Equipment], St. Petersburg, VAS [Military Signal Academy], 1992.

Foreign Broadcast Information Service (FBIS) and Joint Publications Research Service (JPRS) publications contain political, military, economic, environmental, and sociological news, commentary, and other information, as well as scientific and technical data and reports. All information has been obtained from foreign radio and television broadcasts, news agency transmissions, newspapers, books, and periodicals. Items generally are processed from the first or best available sources. It should not be inferred that they have been disseminated only in the medium, in the language, or to the area indicated. Items from foreign language sources are translated; those from English-language sources are transcribed. Except for excluding certain diacritics, FBIS renders personal names and place-names in accordance with the romanization systems approved for U.S. Government publications by the U.S. Board of Geographic Names.

Headlines, editorial reports, and material enclosed in brackets [ ] are supplied by FBIS/JPRS. Processing indicators such as [Text] or [Excerpts] in the first line of each item indicate how the information was processed from the original. Unfamiliar names rendered phonetically are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear from the original source but have been supplied as appropriate to the context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by the source. Passages in boldface or italics are as published.

SUBSCRIPTION/PROCUREMENT INFORMATION

The FBIS DAILY REPORT contains current news and information and is published Monday through Friday in eight volumes: China, East Europe, Central Eurasia, East Asia, Near East & South Asia, Sub-Saharan Africa, Latin America, and West Europe. Supplements to the DAILY REPORTs may also be available periodically and will be distributed to regular DAILY REPORT subscribers. JPRS publications, which include approximately 50 regional, worldwide, and topical reports, generally contain less time-sensitive information and are published periodically.

Current DAILY REPORTs and JPRS publications are listed in *Government Reports Announcements* issued semimonthly by the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161 and the *Monthly Catalog of U.S. Government Publications* issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The public may subscribe to either hardcover or microfiche versions of the DAILY REPORTs and JPRS publications through NTIS at the above address or by calling (703) 487-4630. Subscription rates will be provided by NTIS upon request. Subscriptions are available outside the United States from NTIS or appointed foreign dealers. New subscribers should expect a 30-day delay in receipt of the first issue.

U.S. Government offices may obtain subscriptions to the DAILY REPORTs or JPRS publications (hardcover or microfiche) at no charge through their sponsoring organizations. For additional information or assistance, call FBIS, (202) 338-6735,or write to P.O. Box 2604, Washington, D.C. 20013. Department of Defense consumers are required to submit requests through appropriate command validation channels to DIA, RTS-2C, Washington, D.C. 20301. (Telephone: (202) 373-3771, Autovon: 243-3771.)

Back issues or single copies of the DAILY REPORTs and JPRS publications are not available. Both the DAILY REPORTs and the JPRS publications are on file for public reference at the Library of Congress and at many Federal Depository Libraries. Reference copies may also be seen at many public and university libraries throughout the United States.

END OF

FICHE

DATE FILMED

9 DEC 93